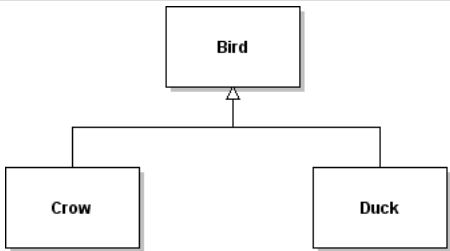


ITICSE 2013

Canterbury QuestionBank

Field	Value
ID	633573 [created: 2013-06-19 15:29:45, author: crjrc (xchris), avg difficulty: 2.0000]
Question	Suppose you try to perform a binary search on a 5-element array sorted in the reverse order of what the binary search algorithm expects. How many of the items in this array will be found if they are searched for?
A	5
B	0
C	1
D	2
E	3
Explanation	Only the middle element will be found. The remaining elements will not be contained in the subranges that we narrow our search to.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Searching-Binary, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632805 [created: 2013-05-24 02:38:28, author: crjrc (xchris), avg difficulty: 0.0000]
Question	Which data structure used to implement <code>Set</code> yields the worst performance for <code>Set.contains</code> ?
A	Binary search tree
B	Linked list
C	Sorted array
D	Hashtable
Explanation	Implementing <code>Set.contains</code> involves a search of the data structure. A binary search tree and a sorted array are searched in $O(\lg n)$ time, and a hashtable in $O(1)$, assuming a sane hash function. A linked list is searched in $O(n)$ time.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, TopicWG-ADT-Set-Implementations, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium

Field	Value
ID	635053 [created: 2013-06-17 08:33:10, author: xrobert (xrobert), avg difficulty: 0.5000]
Question	 <pre> classDiagram Bird < -- Crow Bird < -- Duck </pre> <p>The simplified UML diagram above shows the relationships among Java classes Bird, Crow, and Duck.</p> <p>Suppose Bird has a <code>fly(Location place)</code> method, but we want Crows to <code>makeNoise()</code> just before they take off and then behave like other Birds. Assuming Crows have a <code>makeNoise()</code> method, we should</p>

A	Define a fly method in Crow by copying the fly code from Bird then adding in makeNoise() at the start, i.e.
	<pre>public void fly(Location place) { this.makeNoise(); // [paste the body of Bird's fly method here] }</pre>
B	Define a fly method in Crow that just consists of makeNoise(), i.e.
	<pre>public void fly(Location place) { this.makeNoise(); }</pre>
C	Define a fly method in Crow that just consists of makeNoise() and this.fly(place), i.e.
	<pre>public void fly(Location place) { this.makeNoise(); this.fly(place); }</pre>
D	Define a fly method in Crow that just consists of makeNoise() and super.fly(place)
	<pre>public void fly(Location place) { this.makeNoise(); super.fly(place); }</pre>
E	Define a fly method in Crow that just consists of makeNoise() and Bird.fly(place); i.e.
	<pre>public void fly(Location place) { this.makeNoise(); Bird.fly(place); }</pre>
Explanation	<p>D is the best: super.fly(place) invokes Bird's fly method, so produces fly behavior like other Birds. A would also work, but it does not take advantage of inheritance, and would be incorrect if you change the flying behavior of Birds by modifying Bird's fly method.</p> <p>B wouldn't involve any flight, C wouldn't terminate, and E assumes a static fly method in Bird (which would be unusual design, so I would have mentioned it).</p>
Tags	Contributor_Robert_McCartney, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Language-Java, Bloom-4-Application, CS1, TopicSimon-MethodsFuncsProcs, TopicSimon-OOconcepts, TopicSimon-OperatorOverloading, TopicSimon-Scope-Visibility

Field	Value
ID	633246 [created: 2013-06-18 06:01:40, author: crjirc (xchris), avg difficulty: 1.5000]
Question	For a graph with N nodes, what's the minimum number of edges it must have for it to contain a cycle?
A	N + 1
B	N
C	N - 1
D	1
E	2
Explanation	A vertex with an edge to itself is a cycle.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, TopicWG-Graphs, TopicSimon-CollectionsExceptArray, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634254 [created: 2013-06-25 02:39:10, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Read the following method skeleton and choose the best expression to fill in the blank on line 8 so that the method will behave correctly:

```

/**
 * Takes a string reference and counts the number of times
 * the character 'A' or 'a' appears in the string object.
 * @param aString String reference to object containing chars.
 * @precondition aString is not null (you may assume this is true).
 * @return The number of times 'A' or 'a' appears in the string.
 */
public static int countAs(String aString) // line 1
{
    int counter = _____; // line 2
    int totalA = 0; // line 3
    while (counter < _____) // line 4
    {
        if ( _____ .equals("A") ) // line 5
        {
            totalA = totalA + _____; // line 6
        }
        counter++; // line 7
    }
    return _____; // line 8
}

```

A B C *D* E

Explanation The return type of the method is , so an integer return value must be provided. Since is used as a loop index, it will always end up being the total number of characters in the given string. The variable is used as an accumulator that is incremented each time a letter A is found in the string, so it is the choice that will provide the correct return value for the method.

Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings

Field	Value
ID	633247 [created: 2013-06-18 06:42:17, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Two algorithms accomplish the same task on a collection of N items. Algorithm A performs $\log_2 N$ operations. Algorithm B performs $\log_3 N$ operations. Under what conditions does algorithm A offer better performance?
A	$N \leq 2$
B	$N < \log_2 3$
C	$N < \log_3 2$
D	$N < 8$
E	For no N.
Explanation	For no possible collection size N is $\log_2 N < \log_3 N$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633241 [created: 2013-06-12 23:38:43, author: crjirc (xchris), avg difficulty: 0.5000]
Question	Finding the median value in a complete and balanced binary search tree is
A	$O(1)$
B	$O(\log N)$
C	$O(N)$

D	$O(N^2)$
E	$O(N \log N)$
Explanation	The median is the element that has M elements less than it and M elements greater than it. This can only be said of the root node in a complete and balanced binary tree. The root is accessed in constant time.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Search-Balanced, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634183 [created: 2013-06-24 14:48:04, author: patitsas (xelizabeth), avg difficulty: 0.5000]
Question	For a heap of size n, which is indexed at 0, at what position will its last child be?
A	$2n + 1$
B	$n / 2$
C	$n - 1$
D	$\text{floor}(n / 2) + 1$
Explanation	The last element will be at the end of the array.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicWG-Heaps, Bloom-1-Knowledge, Language-none-none-none, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other

Field	Value
ID	634156 [created: 2013-06-24 11:36:19, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What design strategy does Quicksort use?
A	Greedy
B	Divide and conquer
C	Dynamic programming
D	Brute force
Explanation	Quicksort is divide and conquer.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN

Field	Value
ID	634154 [created: 2013-06-24 11:29:26, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	If you did not have a base case in a recursive function in C, and were working on a modern Unix-based system, what would most likely happen?
A	Segmentation fault
B	Stack overflow error
C	C wouldn't complain, but your computer would crash
D	Nothing, that's fine
Explanation	It really depends on the program for whether it would be B or C. Both can be argued to be correct.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Runtime-StorageManagement, CodeLength-NotApplicable, MultipleAnswers-See-Explanation, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	634956 [created: 2013-06-27 04:51:37, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	<p>The following Python method determines whether or not a list of values, passed in as a parameter, has any duplicate values.</p> <p>What is the Big-Oh running time of this algorithm?</p> <pre>def duplicates(lov): dupCount = 0 outer = 0 while (outer < len(lov)): inner = outer + 1 while (inner < len(lov)): if (lov[inner] == lov[outer]): dupCount = dupCount + 1 inner = inner + 1 outer = outer + 1 if (dupCount == 0): print "there are no duplicate values" else: print "there are ", dupCount, " duplicate values"</pre>
A	O(1)
B	O(n)
C	O(n log ₂ n)
D	O(n ²)
E	O(n ³)
Explanation	<p>Each item in the list is compared against each other item in the list: a classic example of the <i>all-pairs</i> programming pattern. The first item is compared against n-1 other values. The second item is compared against n-2 other values, etc. The total number of comparisons is $\sum_{i=1}^n i$</p>
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-Python, CS1, CodeLength-lines-00-to-06_Low

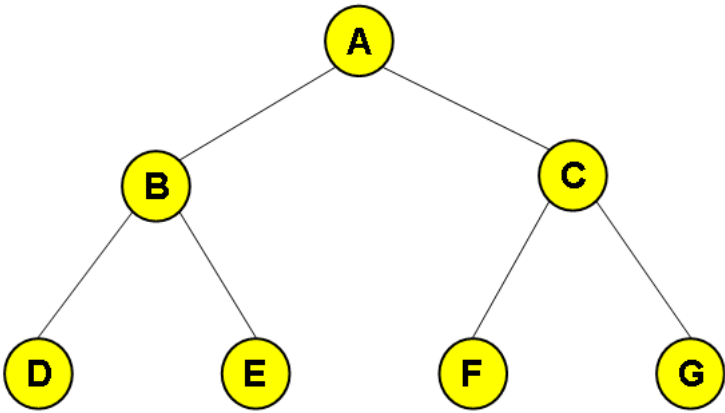
Field	Value
ID	633227 [created: 2013-06-12 22:57:35, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre>public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getTrue() getTrue(); } }</pre>
A	TT
B	T
C	F

D	TF
E	Nothing is printed.
Explanation	If the first operand for is true, as is the case here, the second is not evaluated.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Block-Horizontal-2-Struct_Control, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633298 [created: 2013-06-18 07:59:20, author: crjjrc (xchris), avg difficulty: 2.0000]
Question	You are storing a complete binary tree in an array, with the root at index 0. At what index is node i's parent?
A	2i
B	2i + 1
C	i + i + 2
D	i / 2 + 1
E	(i - 1) / 2
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-CollectionsExceptArray, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634959 [created: 2013-06-13 11:30:52, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following abstract datatypes would be the best choice for part of the implementation of the part of a compiler that determines whether the parentheses in a program are balanced?
A	A Stack
B	A Queue
C	A List
D	A PriorityQueue
E	A Dictionary
Explanation	A close parenthesis must match the most recently entered open parenthesis. So for example, the sequence <code>)()()</code> doesn't match, while <code>()()</code> and <code>(())</code> do, even though they all have two open and two close parentheses. To make this work, you can push each open parenthesis on a Stack, and pop it off each time you see a close parenthesis. The last-in-first-out nature of a Stack makes it easy to determine whether the parentheses are balanced.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, LinguisticComplexity-2-Medium, CSOther, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634960 [created: 2013-06-19 15:55:57, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	



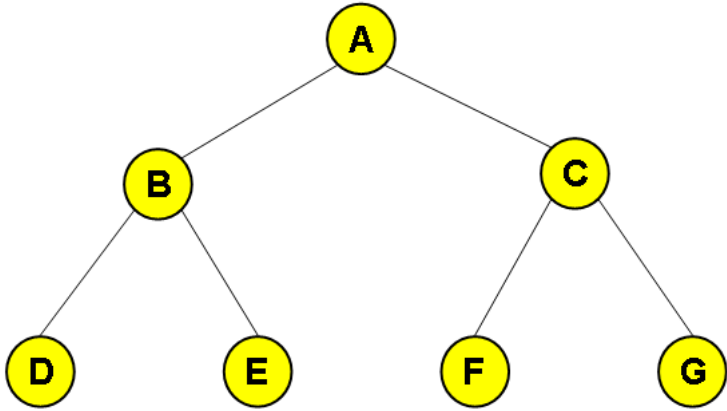
Given the above binary tree rooted at Node A, what is the order of nodes visited by an inorder search?

A	A, B, C, D, E, F, G
B	A, B, D, E, C, F, G
C	D, B, E, A, F, C, G
D	D, E, B, F, G, C, A
E	G, F, E, D, C, B, A
Explanation	<p>An inorder search of a binary tree is: visit the left subtree, visit the root, visit the right subtree.</p> <p>It proceeds as</p> <p>Visit left subtree:</p> <p> Visit its left subtree:</p> <p> Visit D</p> <p> Visit B (its root)</p> <p> Visit its right subtree:</p> <p> Visit E</p> <p>Visit A (the root)</p> <p>Visit right subtree:</p> <p> Visit its left subtree:</p> <p> Visit F</p> <p> Visit C (its root)</p> <p> Visit its right subtree:</p> <p> Visit G</p>
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Language-none-none-none, CS2, ConceptualComplexity-1-Low, TopicWG-Trees-Other

Field	Value
ID	633228 [created: 2013-06-12 23:02:26, author: crjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre>public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } }</pre>

	<pre>public static void main(String[] args) { getTrue() getFalse(); }</pre>
A	TF
B	F
C	T
D	TT
E	Nothing is printed
Explanation	If the first operand for is true, as is the case here, the second is not evaluated.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633895 [created: 2013-06-23 13:10:08, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Kexin is hashing the values 9, 45, 22, 48, 38 into a hash table of size 20. Which hash function will give her no collisions?
A	$h(k) = k \% 10$
B	$h(k) = k / 10$
C	$h(k) = (k \% 10) + (k / 10)$
D	$h(k) = (k \% 10) - (k / 10)$
Explanation	A will collide on the 48/38; B will collide with 45/48; C will collide with 9/45.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable

Field	Value
ID	634955 [created: 2013-06-19 16:04:01, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	 <p>Given the above binary tree rooted at Node A, what is the order of nodes visited by a postorder search?</p>
A	A, B, C, D, E, F, G
B	A, B, D, E, C, F, G
C	D, B, E, A, F, C, G
D	D, E, B, F, G, C, A

E	G, F, E, D, C, B, A
Explanation	<p>A postorder search of a tree is: visit the left subtree, visit the right subtree, visit the root</p> <p>It proceeds as</p> <p>Visit left subtree:</p> <p> Visit its left subtree:</p> <p> Visit D</p> <p> Visit its right subtree:</p> <p> Visit E</p> <p> Visit B (its root)</p> <p>Visit right subtree:</p> <p> Visit its left subtree:</p> <p> Visit F</p> <p> Visit its right subtree:</p> <p> Visit G</p> <p> Visit C (its root)</p> <p>Visit A (the root)</p> <p>The order of nodes visited corresponds to answer D</p>
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, Difficulty-2-Medium, Language-none-none-none, CS2, CodeLength-NotApplicable, TopicWG-Trees-Other

Field	Value
ID	633618 [created: 2013-06-22 07:01:21, author: jspacco (xjaime), avg difficulty: 2.0000]
Question	<p>True or False:</p> <p>Breadth-first search (BFS) and Depth-first search (DFS) visit nodes of a graph in the same order only if the graph looks like a linear chain, or linked list, and the traversal starts at one of the ends.</p> <p>For example, BFS and DFS starting at node A are the same for the following graph:</p> <p>A <-> B <-> C</p>
A	True
B	False
Explanation	We could add any number of nodes to node B, and visit nodes in the same order starting at node A and node B.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634944 [created: 2013-06-27 05:20:14, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	For the Insertion sort algorithm; what is its best case and worst case performance?
A	<p>Best: $O(n)$</p> <p>Worst: $O(n^2)$</p>
B	<p>Best: $O(n)$</p> <p>Worst: $O(n)$</p>
C	<p>Best: $O(\log_2 n)$</p> <p>Worst: $O(n^2)$</p>
D	<p>Best: $O(n^2)$</p> <p>Worst: $O(n^2)$</p>
E	None of the above.

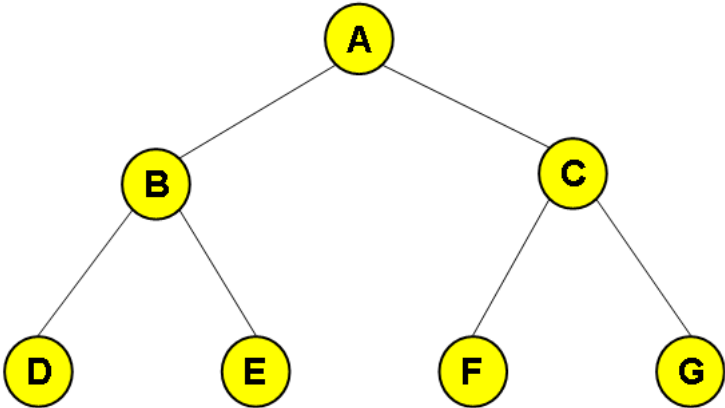
Explanation	Insertion sort, if given an already sorted list, will still perform $O(n)$ comparisons to ascertain the list is sorted. If the list is "reverse sorted," then the first pass will require 1 exchange. The second pass will require 2 exchanges, etc. Hence, in the worst case, $O(n^2)$ exchanges.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Bloom-4-Application, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic

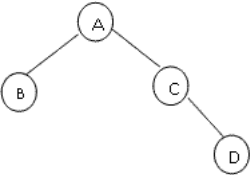
Field	Value
ID	634947 [created: 2013-06-27 05:15:25, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	For the selection sort algorithm; what is its best case and worst case running time?
A	Best: $O(1)$ Worst: $O(n)$
B	Best: $O(n)$ Worst: $O(n^2)$
C	Best: $O(\log_2 n)$ Worst: $O(n)$
D	Best: $O(n^2)$ Worst: $O(n^2)$
E	None of the above.
Explanation	Selection sort repeatedly runs the Find-largest algorithm as its helper function. So, regardless of the list's initial ordering, Find-largest will cost $n-1$ comparisons for the first pass, $n-2$ for the second, etc. Hence selection sort's run time performance is independent of the list's initial ordering: $O(n^2)$
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-4-Application, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic

Field	Value
ID	633400 [created: 2013-06-19 07:39:28, author: crjirc (xchris), avg difficulty: 0.0000]
Question	You see the expression <code>n = 100000</code> in some code that successfully compiles. What type can <code>n</code> not be?
A	int
B	short
C	float
D	double
E	long
Explanation	Shorts can only hold values in [-32768, 32767].
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633397 [created: 2013-06-19 07:53:52, author: crjirc (xchris), avg difficulty: 2.0000]
Question	Suppose you try to perform a binary search on the unsorted array {1, 4, 3, 7, 15, 9, 24}. Which element will not be found when you try searching for it?
A	7
B	1
C	9
D	15

E	24
Explanation	The answer is 15. The first check will look at 7. 15 is greater than 7, so we search to its right. The second check will look at 9. 15 is greater than 9, so we search to its right. The third check will look at 24. 15 is less than 24, so we look to its left. However, our range has just been inverted and our searching stops, not having found 15.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Searching-Binary, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634952 [created: 2013-06-19 16:10:24, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<div></div> <p>Given the above binary tree rooted at Node A, what is the order of nodes visited by a breadth-first traversal?</p>

Field	Value
ID	632111 [created: 2013-06-17 20:52:33, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	<p>What node will be in a same rank (position) if the following tree is traversed by preorder, postorder and inorder algorithm?</p> <div></div>
A	A

B	B
C	C
D	D

Field	Value
ID	634167 [created: 2013-06-24 14:21:36, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	<p>Fill in the single missing line of code:</p> <pre>int p, *r, **q;</pre> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>p = 27; r = &p;</pre> </div> <pre>// MISSING LINE printf("The value is %d", **q); // prints 27.</pre>
A	*q = *r;
B	q = &r;
C	**q = p;
D	q = &&p;
E	*q = *p;
Explanation	B gets q to point to r, which points to p.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632105 [created: 2013-06-17 20:43:58, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	What would be the performance of removeMin and insert methods in a priority queue if it is implemented by a sorted list?
A	O(1) , O(1)
B	O(1) , O(n)
C	O(n) , O(1)
D	O(n) , O(n)

Field	Value
ID	632090 [created: 2013-06-14 23:50:19, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What is the value of j after this code is executed?</p> <pre>int i = 6, j = 10; j += i;</pre>
A	4
B	6
C	10
D	16
E	Undefined
Explanation	The value of variable i (6) is added to that of variable j (10) resulting in 16 as the new value of j

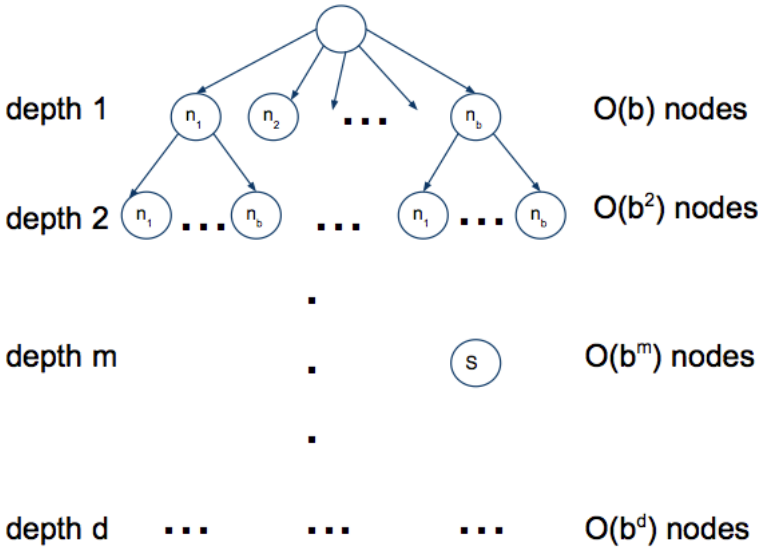
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, CS1, CodeLength-lines-00-to-06_Low
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Field	Value
ID	635019 [created: 2013-06-17 18:06:38, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<p>Suppose q is an instance of a queue that can store Strings, and I execute the following statements starting with q empty:</p> <pre> 1. q.enqueue("Sweden"); 2. q.enqueue("is"); 3. q.enqueue("my"); 4. String w = q.dequeue(); 5. String x = q.peek(); 6. q.enqueue("neighbor"); 7. String y = q.dequeue(); 8. String z = q.dequeue(); </pre> <p>What is the value of z after executing these expressions in order?</p>
A	<input type="radio"/> "Sweden"
B	<input type="radio"/> "is"
C	<input type="radio"/> "my"
D	<input type="radio"/> "neighbor"
E	<input type="radio"/> None of the above
Explanation	<p>If we consider the contents of the queue after each expression (listing contents from head to tail), we have</p> <ol style="list-style-type: none"> ["Sweden"] ["Sweden" "is"] ["Sweden" "is" "my"] ["is" "my"] (and w gets set to "Sweden") ["is" "my"] (and x gets set to "is") ["is" "my" "neighbor"] ["my" "neighbor"] (and y gets set to "is") ["neighbor"] (and z gets set to "my")
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Robert_McCartney, TopicWG-ADT-Queue-DefInterfaceUse, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Language-Java, Bloom-3-Analysis, CS1, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings

Field	Value
ID	634151 [created: 2013-06-24 11:15:44, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following parts of a process' memory is the largest?
A	<input type="radio"/> The code area
B	<input type="radio"/> The globals area
C	<input type="radio"/> The heap
D	<input type="radio"/> The stack
Explanation	Heap is the largest.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Language-C, Language-Cplusplus, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Runtime-StorageManagement, CodeLength-NotApplicable, ConceptualComplexity-1-Low

Field	Value
ID	634145 [created: 2013-06-24 10:06:00, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Prim's Algorithm is used to solve what problem?

A	Finding the lowest parent of a heap
B	Minimum spanning tree
C	Shortest path in a graph from a source
D	Sorting integers
Explanation	Prim's is used for MST.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, TopicWG-Graphs, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low

Field	Value
ID	633268 [created: 2013-06-21 08:44:26, author: jspacco (xjaime), avg difficulty: 2.0000]
Question	<p>Suppose you have a tree with a maximum depth of d and an average branching factor of b (i.e. each node has b children). You are searching for a particular node S located at depth m ($m \leq d$). You don't know where the node S is located, just that it is at depth m.</p> <p>What is an upper bound on the <i>space</i> complexity of breadth-first search (i.e. big-O notation) to find the node S starting from the root?</p>
A	$O(d * b)$
B	$O(b^d)$
C	$O(d^b)$
D	$O(b * m)$
E	$O(b^m)$
Explanation	<p>In the worst case, we need to store all of the nodes, because the very last node we check at the maximum depth will be S. The deepest nodes of the graph will have $O(b^d)$ nodes, and in the worst case we would need to store all of these nodes.</p>  <p>depth 1 $O(b)$ nodes</p> <p>depth 2 $O(b^2)$ nodes</p> <p>depth m $O(b^m)$ nodes</p> <p>depth d $O(b^d)$ nodes</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, SkillWG-AnalyzeCode, ATT-Type-Why, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630945 [created: 2013-06-13 11:17:07, author: kate (xkate), avg difficulty: 1.0000]
Question	Which of the following abstract datatypes would be the best choice for part of the implementation of the back button on a Web browser?
A	a Stack
B	a Queue

C	a Priority Queue
D	a List
E	a Dictionary
Explanation	When you click on the back button, you should see the last page you visited, so the datatype that stores the previously visited webpages must be last-in-first-out. Of the abstract datatypes listed, Stack is the only one that is last-in-first-out.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630947 [created: 2013-06-13 11:22:53, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following abstract datatypes would be the best choice for part of the implementation of a program modeling the arrival of patients to an emergency room in a hospital?
A	a Stack
B	a Queue
C	A List
D	a PriorityQueue
E	a Dictionary
Explanation	In an emergency room, you want to serve patients in the order of how urgent their condition is, and if two patients have equally urgent conditions, in the order that they arrived. A PriorityQueue is the only abstract datatype listed that meets both of these conditions.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, CS2, LinguisticComplexity-3-High, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633266 [created: 2013-06-18 06:45:34, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Two algorithms accomplish the same task on a collection of N items. Algorithm A performs $N/2$ operations. Algorithm B performs $N \log N$ operations. Under what conditions does algorithm A offer better performance?
A	$N \leq 4$
B	$N > 8$
C	$N > 2$
D	For all N.
E	For no N.
Explanation	For all legal collection sizes, $N/2 < N \log N$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633260 [created: 2013-06-18 06:59:27, author: crjirc (xchris), avg difficulty: 1.0000]
Question	When is an adjacency matrix a good choice for implementing a graph?
A	When the graph is undirected.
B	When the graph is nearly complete.

C	When a graph has few edges.
D	When the graph contains no cycles.
E	When the graph is connected.
Explanation	The adjacency matrix will compactly and efficiently store edges when it contains little wasted space. In a complete graph, each vertex shares an edge with each other vertex, meaning all elements in the adjacency matrix will be used.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634147 [created: 2013-06-24 10:13:14, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	What is true about the pivot in quicksort?
A	Before partitioning, it is always the smallest element in the list
B	After partitioning, the pivot will always be in the centre of the list
C	After partitioning, the pivot will never move again
D	A random choice of pivot is always the optimal choice, regardless of input
Explanation	As the pivot will be to the right of all smaller elements and to the left of all larger elements, it is in the same position it will be when the array is sorted.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-Why, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, ConceptualComplexity-1-Low

Field	Value
ID	633259 [created: 2013-06-18 07:06:15, author: crjrc (xchris), avg difficulty: 1.0000]
Question	When is an adjacency list a good choice for implementing a graph?
A	When the graph is undirected.
B	When the graph is nearly complete.
C	When a graph has few edges.
D	When the graph contains no cycles.
E	When the graph is connected.
Explanation	With adjacency lists are used, each vertex stores its own list of vertices it's connected to. When a graph contains few edges, these lists will be very short and will likely consume less memory than the adjacency matrix.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633257 [created: 2013-06-18 07:17:06, author: crjrc (xchris), avg difficulty: 2.0000]
Question	You've got an algorithm that is $O(N^2)$. On the first run, you feed it a collection of size M . On the second run, you feed it a collection of size $M/2$. Assuming each run has worst-case performance, how much time does the second run take?
A	1/4 of the first
B	1/2 of the first
C	2/3 of the first
D	3/4 of the first
E	1/8 of the first

Explanation	The first run took time proportional to M^2 . The second run took $(M/2)^2$, or $M^2/4$. The second run is 1/4 of the first.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633245 [created: 2013-06-18 05:59:09, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Two algorithms accomplish the same task on a collection of N items. Algorithm A performs N^2 operations. Algorithm B performs 10N operations. Under what conditions does algorithm A offer better performance?
A	$N < 10$
B	$N < 100$
C	$N > 10$
D	For all N.
E	For no N.
Explanation	The two algorithms offer equal performance when $N = 10$. For N greater than 10, $N^2 > 10N$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, Block-Vertical-3-Relations, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

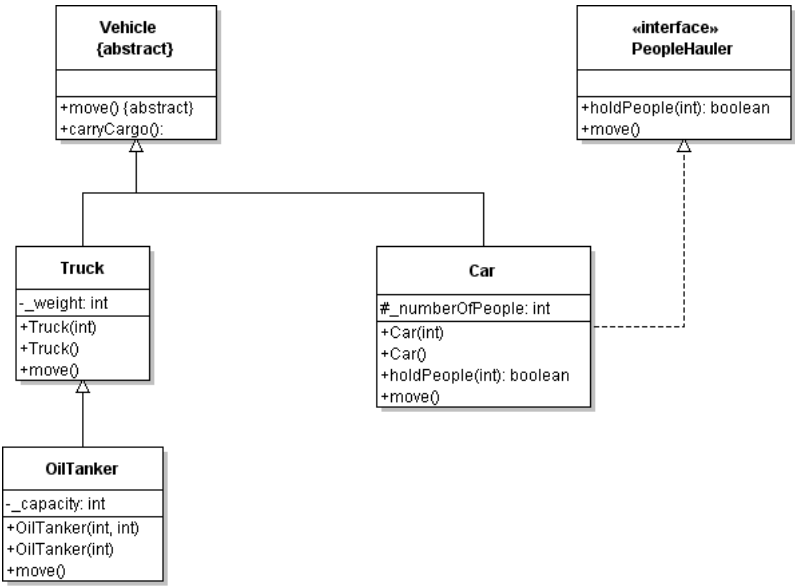
Field	Value
ID	635006 [created: 2013-06-17 16:42:33, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public BallPanel extends javax.swing.JPanel { 2. private Ball[] _balls; 3. public BallPanel(int numberOfBalls){ 4. ?????? 5. for (int i=0;i<_balls.length;i++) 6. _balls[i] = new Ball(); 7. } 8. } </pre> <p>We need to add something at line 4 above to avoid an error in line 5. Which of the following line 4 expressions fix the error in line 5?</p>
A	<code>super();</code>
B	<code>_balls.setLength(numberOfBalls);</code>
C	<code>_balls = new Ball[numberOfBalls];</code>
D	<code>_balls.length = numberOfBalls;</code>
E	B, C, and D all work.
Explanation	<p>The problem with line 5 (without adding line 4) is that <code>_balls</code> is declared, but not instantiated as an array, so <code>_balls</code> is null. The code compiles fine (assuming you have a class <code>Ball</code> that has a constructor with no parameters), but will crash at run time if you instantiate a <code>BallPanel</code>.</p> <p>B and D wouldn't help: B would crash at run time for the same reason as 5, and D gives a compile-time error since <code>length</code> is not directly settable for a Java array. A would work, but would have no effect on the problem.</p>
Tags	Contributor_Robert_McCartney, ATT-Type-How, Difficulty-2-Medium, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	633279 [created: 2013-06-21 09:08:12, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Which of the following makes an appropriate pre-condition for this code?</p> <pre>double calculate_percentage(double sum, double n) { </pre>

	<pre>// calculates and returns a percentage given a sum and a length (n) // <missing pre-condition> // POST: none return (sum / n) * 100; }</pre>
A	PRE: sum < 100
B	PRE: n != 0
C	PRE: sum != NULL and n != NULL
D	PRE: none
Explanation	The code will fail if n = 0, as it will divide by 0.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-3-Relations, Language-C, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-ProgrammingStandards, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	629623 [created: 2013-06-10 10:14:09, author: kate (xkate), avg difficulty: 0.0000]
Question	Consider writing a program to be used by a farm to keep track of information about the fruits and vegetables they sell. For each sale, they would like to keep track of the type of item (eggplant, tomato, etc.), the quantity sold, the price, and the market at which the sale was made. Which of the following is the best way to represent the information?
A	Define one class, <code>FarmSale</code> , with four fields: <code>type</code> , quantity, price, and market.
B	Define one superclass, <code>FarmSale</code> , with four subclasses: <code>Type</code> , <code>Quantity</code> , <code>Price</code> , and <code>Market</code> .
C	Define five unrelated classes: <code>FarmSale</code> , <code>Type</code> , <code>Quantity</code> , <code>Price</code> , and <code>Market</code> .
D	Define five classes: <code>FarmSale</code> , <code>Type</code> , <code>Quantity</code> , <code>Price</code> , and <code>Market</code> . Make <code>Market</code> a subclass of <code>Price</code> , make <code>Price</code> a subclass of <code>Quantity</code> , make <code>Quantity</code> a subclass of <code>Type</code> , and make <code>Type</code> a subclass of <code>FarmSale</code> .
E	Define five classes: <code>FarmSale</code> , <code>Type</code> , <code>Quantity</code> , <code>Price</code> , and <code>Market</code> . Make <code>FarmSale</code> a subclass of <code>Type</code> , make <code>Type</code> a subclass of <code>Quantity</code> , make <code>Quantity</code> a subclass of <code>Price</code> , and make <code>Price</code> a subclass of <code>Market</code> .
Explanation	<p>Which classes you define depends generally on the needs of the software. It might be good to have <code>Market</code> be a class of its own, with the address of the market, contact information for the organizers, etc. The item type might be modeled with a <code>Product</code> class, with information about the date it was planted, for example.</p> <p>But of the choices given, A is the best. We can rule out choices B, C, D, and E because price and quantity don't need data and associated methods of their own and are most appropriately modeled as fields in the <code>FarmSale</code> class. That leaves A.</p>
Tags	Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Transition-English_to_CSspeak, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Language-Java, Bloom-5-Synthesis, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	629642 [created: 2013-06-10 11:02:04, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	



The word `abstract` in the class box for `Vehicle` means:

A	<code>Vehicle</code> is the top level of the hierarchy
B	Objects of type <code>Vehicle</code> can not be instantiated
C	All concrete subclasses of <code>Vehicle</code> must implement or inherit all of <code>Vehicle</code> 's <code>abstract</code> methods
D	Both B and C are true
E	All of the above
Explanation	An object cannot be <i>directly</i> instantiated from an abstract class, i.e. <code>Vehicle v = new Vehicle();</code> is not legit, so B is true. It is also true that every concrete (non-abstract) subclass of Vehicle must implement or inherit all of the methods defined as abstract in <code>Vehicle</code> . So D is the answer.
Tags	Contributor_Robert_McCartney

Field	Value
ID	629645 [created: 2013-06-10 11:08:26, author: kate (xkate), avg difficulty: 1.0000]
Question	Suppose you are writing a Java program to be used to manage information about the inventory in a store. The store's products include pagers, cell phones, and cameras. The cell phones are used for both communication and taking pictures, the pagers are only used for communication, and the cameras are used for taking pictures. Assume that a <code>Product</code> class has been defined. Which of the following is the best way to represent the remaining data?
A	Define two subclasses of the <code>Product</code> class: <code>Communicator</code> and <code>PictureTaker</code> . Define two subclasses of the <code>Communicator</code> class: <code>Pager</code> and <code>CellPhone</code> ; and define two subclasses of the <code>PictureTaker</code> class: <code>CellPhone</code> and <code>Camera</code> .
B	Define three subclasses of the <code>Product</code> class: <code>Pager</code> , <code>CellPhone</code> and <code>Camera</code> . Also define two interfaces: <code>Communicator</code> and <code>PictureTaker</code> . Define the <code>Pager</code> and <code>CellPhone</code> classes to implement the <code>Communicator</code> interface, and define the <code>CellPhone</code> and <code>Camera</code> classes to implement the <code>PictureTaker</code> interface.
C	Define five new classes, not related to the <code>Product</code> class: <code>Pager</code> , <code>CellPhone</code> , <code>Camera</code> , <code>Communicator</code> , and <code>PictureTaker</code> .
D	Define five subclasses of the <code>Product</code> class: <code>Pager</code> , <code>CellPhone</code> , <code>Camera</code> , <code>Communicator</code> , and <code>PictureTaker</code> .
E	Define two subclasses of the <code>Product</code> class: <code>Communicator</code> and <code>PictureTaker</code> . Also define three interfaces: <code>Pager</code> , <code>CellPhone</code> , and <code>Camera</code> . Define the <code>Communicator</code> class to implement the <code>Pager</code> and <code>CellPhone</code> interfaces, and define the <code>PictureTaker</code> class to implement the <code>CellPhone</code> and <code>Camera</code> interfaces.
Explanation	Answer A is the easiest to rule out -- it gives <code>CellPhone</code> two superclasses, which is not permitted in Java. C is not the best choice because it doesn't capture the relationships among the various items. D captures some of the relationships but not all (for example, it's missing the relationship between <code>PictureTaker</code> and <code>Camera</code>). Answers B and E are very similar -- they focus on the question of which items should be modeled by interfaces and which by classes. B is a better choice for several reasons. Pagers, phones, and cameras all have both behaviors and data -- for example, the list of phone messages for a phone and the ability to take pictures for

	both phones and cameras -- while PictureTaker and Communicator correspond to behaviors. In addition, defining PictureTaker as an interface allows us to capture the fact that a cell phone is a product, a picture taker, *and* a communicator.
Tags	Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Transition-English_to_CSspeak, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Language-Java, Bloom-5-Synthesis, CS1, LinguisticComplexity-2-Medium, TopicSimon-OOconcepts, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632075 [created: 2013-06-16 23:35:26, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>Consider the following short program, which does not meet all institutional coding standards:</p> <pre>void vCodeString(char szText[]); /* First line */ #include <stdio.h> #include <string.h> #define MAX_LEN 12 int main(void) { char szData[MAX_LEN]; printf("Enter some text to code: "); scanf("%s", szData); vCodeString(szData); /* Line 8 */ printf("Coded string is %s\n", szData); } void vCodeString(char szText[]) { int i = -1; while(szText[++i]) { szText[i] += (char)2; } } I would like to combine lines 8 and 9 into printf("Coded string is %s\n", vCodeString(szData)); Unfortunately, this gives me a syntax error. Why? </pre>
A	The %s should be replaced by %c.
B	The parameter to vCodeString should be szText
C	The parameter to vCodeString should be shown as szData[].
D	printf can only match %s to a variable, not to a function.
E	vCodeString does not return a value.
Explanation	The printf function cannot take as a parameter a function which does not return a value
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium

Field	Value
ID	635015 [created: 2013-06-25 15:43:03, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	The binary value 11011101 when covered into a decimal value from two's complement notation is:
A	-35

B	35
C	221
D	-221
E	-33
Explanation	Conversion of negative numbers in two's complement into decimal requires a bit flip, followed by the binary addition of 1. This value is then interpreted as an unsigned binary value.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, TopicWG-Numeric-Int-Representatio, CS1, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632068 [created: 2013-06-17 08:31:20, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Note draft only topics and explanation tba</p> <p>Consider the following short program:</p> <pre>#include <stdio.h> void f1(void); int a; void main(void) { int b; a = b = 1; f1(); printf("%d %d", a, b); } void f1(void) { int b = 3; a = b; }</pre> <p>The output from the print statement will be:</p>
A	1 1
B	1 3
C	3 1
D	3 3
E	3 5
Explanation	Explanation to be completed
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-IO, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium

Field	Value
ID	633240 [created: 2013-06-12 23:39:05, author: crjrc (xchris), avg difficulty: 1.0000]
Question	Finding the minimum value in a complete and balanced binary search tree is
A	O(1)
B	O(log N)

C	$O(N)$
D	$O(N^2)$
E	$O(N \log N)$
Explanation	The minimum is the root's left-most descendent, which can be reached in $\log N$ steps.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Search-Balanced, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634971 [created: 2013-06-19 12:54:06, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	An interface in Java can appropriately be used to model
A	Abstract classes
B	Unrelated classes that share particular capabilities
C	Related classes that share particular attributes
D	Classes that communicate using the same network protocol
E	None of the above
Explanation	Interfaces allow us to specify common capabilities in unrelated classes: a way to say that two classes have the same methods without specifying the implementation (and allowing completely different implementations). For closely related classes (near each other in inheritance hierarchy) we can get common capabilities by having them in a common ancestor. Abstract classes provide a method to specify common capabilities via inheritance. Interfaces cannot be used to specify that two classes share a set of attributes (i.e. instance variables), which can be done by having classes inherit from a common ancestor with those attributes.
Tags	ATT-Transition-English_to_CSspeak, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-1-Low, Language-Java, Bloom-2-Comprehension, CS1, CS2, TopicSimon-ProgramDesign

Field	Value
ID	629971 [created: 2013-06-11 11:41:11, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you are defining a Java <code>ProductItem</code> class to store information about the inventory in a store, and you want to give the class an instance variable for the number of those items currently in stock. Choose the best datatype for modeling this number:
A	<code>double</code>
B	<code>float</code>
C	<code>int</code>
D	a user-defined <code>NumberInStock</code> class
E	<code>String</code>
Explanation	A and B are wrong because you want to model an integer, not a floating point number. E is wrong because you probably want to use this number for adding and subtracting, not just for display. D is less good than C, because the built-in operations on ints will most likely be sufficient for the purposes of this variable.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-5-Synthesis, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633256 [created: 2013-06-21 08:29:47, author: jspacco (xjaime), avg difficulty: 2.0000]
Question	Suppose you have a tree with a maximum depth of d and an average branching factor of b (i.e. each node has b children). You are searching for a particular node S located at depth m ($m \leq d$). You don't know where the node S is located, just that it is at depth m . What is an upper bound on the runtime complexity of breadth-first search (i.e. big-O notation) to find the node S starting from the root?
A	$O(d * b)$

B	$O(b^d)$
C	$O(d^b)$
D	$O(b * m)$
E	$O(b^m)$
Explanation	<p>In the worst-case, you would keep choosing sub-tree containing S last, and have to keep searching. Thus the worst-case is $O(b^d)$.</p> <p>The following picture may help:</p> <p>depth 1 $O(b)$ nodes</p> <p>depth 2 $O(b^2)$ nodes</p> <p>depth m $O(b^m)$ nodes</p> <p>depth d $O(b^d)$ nodes</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, ATT-Type-Why, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633604 [created: 2013-06-22 04:02:06, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What wil the following code print, assuming that N is a positive integer?</p> <pre>int count=0; for (int i=0; i<N; i++) { if (i % 2 == 0) { count++; } } System.out.println(count);</pre>
A	N
B	$N/2$
C	$N/2+1$
D	$(N+1)/2$
E	0 (i.e. the loop body never executes)
Explanation	<p>If N is even, for example $N=12$, $N/2$ works. However, suppose N is odd, for example $N=13$. Here the result should be 7, which is $(N+1)/2$. However, for $N=12$, $(N+1)/2$ also works. $(N+1)/2$ works for all positive integer.</p>
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634906 [created: 2013-06-18 06:48:04, author: crjrc (xchris), avg difficulty: 1.0000]
Question	Two algorithms accomplish the same task on a collection of N items. Algorithm A performs $(N/2)^3$ operations. Algorithm B performs N^2 operations. Under what conditions does algorithm A offer strictly better performance?
A	$N \leq 7$
B	$N \leq 8$
C	$N > 8$
D	For all N
E	For no N
Explanation	For $N \leq 7$, $(N/2)^3 < N^2$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632474 [created: 2013-06-19 04:45:21, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Identify the bug in the following Java code (if any):</p> <pre>public boolean search(T item, ListADT<T> list){ // 1 if (list == null) // 2 return false; // 3 else if (list.first()==item) // 4 return true; // 5 else // 6 return this.search(item, list.rest()); // 7 } // 8</pre>
A	There is no base case
B	The problem is not self-similar
C	The problem does not get smaller
D	There are no bugs
E	None of the above
Explanation	<p>For a recursive solution to a problem, you need three things:</p> <ul style="list-style-type: none"> (1) a base case (where the problem can be solved without recursion) (2) a self-similar problem (one that contains similar problem(s) to itself) (3) a way of making the problem smaller so you get closer to the base case <p>Here (2) is satisfied -- lists contain smaller lists. (1) is satisfied by lines 2-5 of the method. And (3) is satisfied because line 7's recursive call takes the rest of the list as a parameter, rather than the whole list.</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, Skill-DebugCode, ATT-Transition-Code_to_CSspeak, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	634918 [created: 2013-06-18 12:51:27, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose QueueADT is implemented using a singly linked list. What is the lowest Big-Oh time complexity that can be achieved for an enqueue method?:
A	$O(1)$
B	$O(\log_2 n)$
C	$O(n)$

D	$O(n^2)$
E	none of the above
Explanation	If you keep a pointer to the last element of the queue, then the enqueue method just needs a fixed number of statements, which are the same independent of the size of the queue.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, TopicWG-ADT-Queue-Implementations, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633554 [created: 2013-06-19 08:37:39, author: crjrc (xchris), avg difficulty: 1.0000]
Question	What terminates a failed linear probe in a full hashtable?
A	The end of the array
B	A deleted node
C	A null entry
D	A node with a non-matching key
E	Revisiting the original hash index
Explanation	A null entry will not appear in a full hashtable. Seeing the end of the array isn't correct, since we need to examine all elements, including those that appear before our original hash index. A node with a non-matching key is what started our probe in the first place. The purpose of leaving a deleted node in the table is so that probing may proceed past it. Revisiting the original hash index means we've looked at every entry and determined the item doesn't appear in the table.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632810 [created: 2013-06-20 09:28:02, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	Which of the following assertions is <i>incorrect</i> ?
A	A Python statement may return a value
B	A Python expression may return a value
C	A Python statement may produce a side effect
D	A Python expression may produce a side effect
E	None of the above (i.e., all are correct)
Explanation	Basically, a statement in Python is a special kind of function that doesn't return a value. Statements are things like <code>print</code> (in Python 2.x but not Python 3) and <code>import</code> . I think this is not a great question to put on a CS-1 exam because it relies on terminology (statement, expression, side-effect) that doesn't really mean much until CS-2 or later.
Tags	Contributor_Jaime_Spacco, ATT-Transition-DefineCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, ConceptualComplexity-1-Low

Field	Value
ID	633665 [created: 2013-06-22 10:50:06, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	Consider the following class for a Ninja: <pre>public class Ninja { private int honor; public Ninja(int h) { this.honor=h; } }</pre>

```
}
}
```

Suppose we instantiate two Ninjas like this:

```
Ninja n1=new Ninja(50);
Ninja n2=new Ninja(50);
```

Is the following statement True, False, or It Depends:

`n1 == n2`

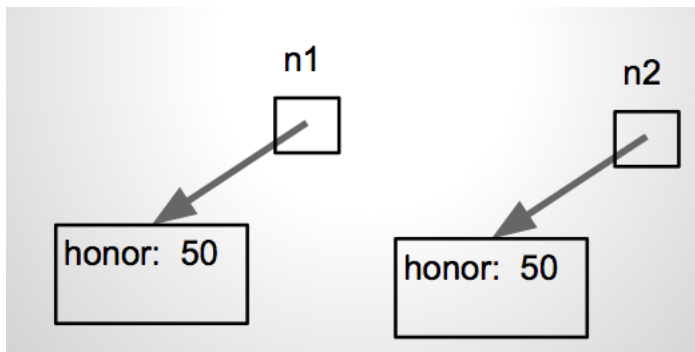
A True

B False

C It depends

(Note: Be ready to explain what it depends upon during the discussion phase of this question)

Explanation These two references are not equal because they reference different instances.



Tags ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634189 [created: 2013-06-24 14:58:54, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	What is not a property of a max-heap?
A	It is complete
B	A node's value is less than or equal to that of its parent
C	Its values are sorted in when printed in level order
D	Its root is the maximum element in the tree
Explanation	A max-heap need not be sorted.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, TopicWG-Heaps, Bloom-1-Knowledge, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable

Field	Value
ID	633882 [created: 2013-06-23 12:49:07, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Barack Obama wants to know the most efficient way to sort a million 32-bit integers. He knows it's not bubble sort. What is?
A	Heapsort
B	Insertion sort
C	Mergesort

D	Radix sort
E	Quicksort
Explanation	Radix sort will be $O(n)$ and works nicely on integers; at such a large scale it will outperform the $O(n \lg n)$ sorting algorithms. (question is a reference to http://www.youtube.com/watch?v=k4RRi_ntQc8)
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-2-Comprehension, Language-none-none-none, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Other, TopicWG-Sorting-Quadratic

Field	Value
ID	634250 [created: 2013-06-25 02:15:23, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Read the following method skeleton and choose the best expression to fill in the blank on line 2 so that the method will behave correctly:</p> <pre> /** * Takes a string reference and counts the number of times * the character 'A' or 'a' appears in the string object. * @param aString String reference to object containing chars. * @precondition aString is not null (you may assume this is true). * @return The number of times 'A' or 'a' appears in the string. */ public static int countAs(String aString) // line 1 { int counter = _____; // line 2 int totalA = 0; // line 3 while (counter < _____) // line 4 { if (_____.equals("A")) // line 5 { totalA = totalA + _____; // line 6 } counter++; // line 7 } return _____; // line 8 } </pre>
A	0
B	1
C	aString.size()
D	aString.length
E	aString.length() - 1
Explanation	This method must examine each character in the given string to see if it is 'A' or 'a', and uses a loop to do so. The variable <code>counter</code> is being used as a loop index, and by imagining what will fill in other blanks, is also being used to keep track of the position of the current character in the string that is being examined. Since line 7 methodically increases <code>counter</code> on each loop iteration, it must be traversing left-to-right through the string, so zero is the best choice for its initial value.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	633561 [created: 2013-06-19 11:34:13, author: crjrc (xchris), avg difficulty: 0.0000]
Question	You are writing a depth-first search on a platform that doesn't support recursion. What data structure can help you complete your task?
A	stack
B	queue
C	priority queue
D	hashtable

E	linked list
Explanation	As you visit nodes, if you push their neighbors on a stack, the neighbors will be the first popped off when you need to backtrack. This behavior is what makes a depth-first search depth-first.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632571 [created: 2013-06-19 14:08:54, author: kate (xkate), avg difficulty: 0.0000]
Question	The worst-case time complexity of radix sort is:
A	$O(1)$
B	$O(n)$
C	$O(k \cdot n)$
D	$O(n^2)$
E	none of the above
Explanation	n is the number of items to be sorted, as usual, and k is the number of digits in the largest number in the list. Radix sort processes the entire list (n numbers) once for each of the k digits in the largest number in the list, so the work done is proportional to $n \cdot k$.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632572 [created: 2013-06-19 14:19:12, author: kate (xkate), avg difficulty: 1.0000]
Question	A chained hash table has an array size of 512. What is the maximum number of entries that can be placed in the table?
A	256
B	511
C	512
D	1024
E	There is no maximum.
Explanation	In a hashtable with chaining, each element is assigned to a particular cell in the array (a "bucket") using the hash function. Each bucket has a pointer to the start of a linked list, and the elements assigned to that bucket are stored in the linked list.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicWG-Hashing-HashTables, Bloom-4-Application, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634253 [created: 2013-06-25 02:35:44, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Read the following method skeleton and choose the best expression to fill in the blank on line 6 so that the method will behave correctly: <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <pre> /** * Takes a string reference and counts the number of times * the character 'A' or 'a' appears in the string object. * @param aString String reference to object containing chars. * @precondition aString is not null (you may assume this is true). * @return The number of times 'A' or 'a' appears in the string. */ public static int countAs(String aString) // line 1 { int counter = _____; // line 2 </pre> </div>

	<pre> int totalA = 0; // line 3 while (counter < _____) // line 4 { if (_____equals("A")) // line 5 { totalA = totalA + _____; // line 6 } counter++; // line 7 } return _____; // line 8 } </pre>
A	0
B	1
C	<code>counter</code>
D	<code>aString.length()</code>
E	<code>aString.charAt(count)</code>
Explanation	The variable <code>totalA</code> is being used as an accumulator to keep track of how many A's have been seen so far as the loop progresses. The if condition inside the loop is intended to detect whether the current character is an "A", and so the variable <code>totalA</code> should be incremented each time the condition is true. Therefore, the best answer for Line 6 is 1, so that <code>totalA</code> is incremented.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	632766 [created: 2013-06-20 04:05:50, author: ray (ray), avg difficulty: 2.0000]
Question	<p>The following code for a method "minVal" contains a logic error on a single line in the method body, on one of the four lines indicated by comments:</p> <pre> public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; // line 1 for (int i=first+1; i<=last; i++) { if (y[i] < y[bestSoFar]) // line 2 bestSoFar = y[i]; // line 3 } // for return bestSoFar; // line 4 } // method minVal </pre> <p>Which one of the four lines indicated by the comments contains the logic error?</p>
A	line 1
B	line2
C	line3
D	line4
Explanation	<p>line 2 should be <code>if (y[i] < bestSoFar)</code></p> <p>The other three lines use bestSoFar to remember the best VALUE seen thus far, whereas the buggy line is using bestSoFar as if bestSoFar contains the POSITION seen thus far.</p>

Tags	Nested-Block-Depth-2-two-nested, Skill-DebugCode, ATT-Transition-DefineCSspeak, Contributor_Raymond_Lister, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Neo-Piaget-3-Concrete_Operational, ConceptualComplexity-2-Medium
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Field	Value
ID	634282 [created: 2013-06-24 14:52:48, author: patitsas (xelizabeth), avg difficulty: 2.0000]
Question	What is the size of the largest max-heap which is also a BST?
A	2
B	1
C	4
D	3
Explanation	You can have a left child of the root, but as soon as you add the right child, it falls apart.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-3-High, ExternalDomainReferences-1-Low, TopicWG-Heaps, Bloom-5-Synthesis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, TopicWG-Trees-Search-NotBalanced

Field	Value
ID	632764 [created: 2013-06-20 04:30:36, author: ray (ray), avg difficulty: 1.0000]
Question	<p>The following code for a method "minVal" contains a logic error on a single line in the method body, on one of the four lines indicated by comments:</p> <pre>public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; // line 1 for (int i=first+1; i<=last; i++) { if (y[i] < bestSoFar) // line 2 bestSoFar = i; // line 3 } // for return bestSoFar; // line 4 } // method minVal</pre> <p>Which one of the four lines indicated by the comments contains the logic error?</p>
A	line 1
B	line2
C	line3
D	line4
Explanation	<p>line 3 should be <code>bestSoFar = y[i];</code></p> <p>The buggy code is remembering an array position, but the correct code remembers the value.</p>
Tags	Nested-Block-Depth-2-two-nested, Skill-DebugCode, ATT-Transition-DefineCSspeak, Contributor_Raymond_Lister, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Neo-Piaget-3-Concrete_Operational, ConceptualComplexity-2-Medium

Field	Value
ID	618493 [created: 2013-05-28 19:48:00, author: marzieh (xmarzieh), avg difficulty: 0.0000]

Question	How many objects and object reference would we have if the following code is executed? Student first_st = new Student(); Student second_st = new Student(); Student third_st = second_st;
A	3, 2
B	2, 3
C	2, 2
D	3, 3

Field	Value
ID	633574 [created: 2013-06-19 15:25:29, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	Suppose you try to perform a binary search on the unsorted array {1, 4, 3, 7, 15, 9, 24}. How many of the items in this array will be found if they are searched for?
A	3
B	4
C	5
D	6
E	0
Explanation	7, 4, 9, 24, and 1 will be found if searched for. 15 and 3 will not, since they lie to the wrong side of a subrange's midpoint.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Searching-Binary, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops


Field	Value
ID	633668 [created: 2013-06-22 10:57:15, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	<p>Consider the following class for a Ninja:</p> <pre>public class Ninja { private int honor; public Ninja(int h) { this.honor=h; } }</pre> <p>Suppose we instantiate two Ninjas like this:</p> <pre>Ninja n1=new Ninja(50); Ninja n2=new Ninja(50);</pre> <p>Is the following statement True, False, or It Depends (i.e. depends on a factor external to this question)</p> <p>n1.equals(n2)</p>
A	True
B	False
C	It depends (Be ready to discuss what it depends on when we get to the discussion phase of this question)
Explanation	<p>The equals() method has not been overloaded, so it's using the default implementation of equals() in Java, which falls back on ==.</p> <p>This is sort of a trick question, but it's a reasonably common error pattern in CS-2.</p>

Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	634432 [created: 2013-06-26 05:14:54, author: kate (xkate), avg difficulty: 2.0000]
Question	Dummy question: Bloom tags.
A	blaha
B	blaha
C	blaha
Explanation	This question has a tag for each one of the Bloom tags so we can see how many questions there are of each. (Note: delimiters are included in case of errors).
Tags	Contributor_Kate_Sanders, Bloom-0-XXXXXXXXXXXXXXXXXXXXXXXXXXXX, Bloom-1-Knowledge, Bloom-2-Comprehension, Bloom-3-Analysis, Bloom-4-Application, Bloom-5-Synthesis, Bloom-6-Evaluation, CS0-AAA-XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Field	Value
ID	631541 [created: 2013-06-15 19:20:47, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	How many number will be printed if n = 5? <pre>public static void cSeries(int n) { System.out.print(n + " "); if (n == 1) return; if (n % 2 == 0) cSeries(n / 2); else cSeries(3*n + 1); }</pre>
A	3
B	4
C	5
D	6

Field	Value
ID	632300 [created: 2013-06-18 11:56:03, author: tclear (xtony), avg difficulty: 0.0000]
Question	For Club Scripting, to be a member a person must be aged 15 or older, but less than 50. What values would you use to boundary test a script designed to check if a person was a suitable age to join?
A	14, 15, 50, 51
B	15, 16, 50, 51
C	15, 16, 49, 50
D	14, 15, 49, 50
E	13, 15, 49, 52
Explanation	The boundary values are those at the boundary and those respectively one before and one past the boundary
Tags	Skill-TestProgram, Contributor_Tony_Clear, Difficulty-1-Low, Bloom-2-Comprehension, Language-none-none-none, CS1, CodeLength-NotApplicable, TopicSimon-Testing

Field	Value
ID	634931 [created: 2013-06-27 07:48:48, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	<p>Consider a picture that is x pixels wide and y pixels tall. Furthermore, consider storing the x*y pixels in a one-dimensional array which stores the pixels in a left-to-right, top-to-bottom manner.</p> <p>Consider the following code:</p> <pre>def pixelSwap (pixels): pixCount = len(pixels) - 1 for p in range(0, len(pixels)/2): tempPixel = pixels[p] pixels[p] = pixels[pixCount - p] pixels[pixCount - p] = tempPixel</pre> <p>If the array of pixels originally represented the following picture:</p>  <p>Which of the following pictures represents the pixel array after invoking pixelSwap?</p> <p>A The picture is unchanged.</p> <p>B The picture is rotated 90 degrees clockwise.</p> <p>C The picture is rotated 90 degrees counterclockwise.</p> <p>*D* The picture is rotated 180 degrees.</p> <p>E None of the above.</p> <p>Explanation The first pixel becomes the last, the second pixel, becomes the second last, etc. This is a list reversing algorithm. For a picture, the result is to rotate it 180 degrees.</p> <p>Tags Contributor_Michael_Goldweber, ATT-Transition-Code_to_English, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Python, Bloom-5-Synthesis, CS1, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-1</p>

Field	Value
ID	634252 [created: 2013-06-25 02:31:46, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	<p>Read the following method skeleton and choose the best expression to fill in the blank on line 5 so that the method will behave correctly:</p> <pre>/** * Takes a string reference and counts the number of times * the character 'A' or 'a' appears in the string object. * @param aString String reference to object containing chars. * @precondition aString is not null (you may assume this is true). * @return The number of times 'A' or 'a' appears in the string. */</pre>

```

public static int countAs(String aString) // line 1
{
    int counter = _____;           // line 2
    int totalA = 0;                       // line 3
    while (counter < _____)         // line 4
    {
        if ( _____.equals("A") )    // line 5
        {
            totalA = totalA + _____; // line 6
        }
        counter++;                       // line 7
    }
    return _____;                   // line 8
}

```

A `aString.charAt(counter)`B `aString.substring(counter)`C `aString.charAt(counter).toUpperCase()`D `aString.substring(counter).toUpperCase()`*E* `aString.substring(counter, counter + 1).toUpperCase()`

Explanation While both `charAt()` can be used to examine a single `char` in a string, `char` is a primitive type without any methods. Since the condition on Line 5 uses the `equals()` method to compare against another String value, the expression used to fill in the blank must produce a String object, so the `substring()` method is a better fit. The `substring()` method takes two parameters—a starting index and an ending index one past the end of the substring—and since the method counts both upper case and lower case A's, the result should be converted to upper case form before testing for equality against `"A"`. Thus, the best answer is `aString.substring(counter, counter + 1).toUpperCase()`.

Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	634932 [created: 2013-06-19 07:19:57, author: crjirc (xchris), avg difficulty: 1.0000]
Question	You need to traverse a singly-linked list in reverse. What's the best worst-case performance you can achieve?
A	$O(1)$
B	$O(\log N)$
C	$O(N)$
D	$O(N \log N)$
E	$O(N^2)$
Explanation	Iterate through the list in the forward direction, but prepend each node on a second list as you do. Then iterate through the second list, which will be in the desired reverse order and traversable in $O(N)$ time.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-1-Low, TopicWG-ADT-Stack-DefInterfaceUse, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-LinkedLists, Bloom-4-Application, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632271 [created: 2013-06-18 10:27:39, author: kate (xkate), avg difficulty: 1.0000]
Question	Which data structure can be used to implement an abstract datatype such as the StackADT or QueueADT?
A	an array
B	a linked list
C	both
D	neither

Explanation	StackADT and QueueADT can both be implemented with either an array or a stack. Either may be the better choice, depending on the purpose of the program and the nature of the data being stored.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-3-Relations, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632278 [created: 2013-06-18 10:38:46, author: kate (xkate), avg difficulty: 1.0000]
Question	Which data structure uses space more efficiently if the program is storing substantially less data than expected?
A	An array
B	A linked list
C	They are both the same
Explanation	For an array, you must set aside a block of memory in advance. A linked list only creates nodes for those elements that are actually contained in the list.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	617507 [created: 2013-05-17 12:16:22, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.5000]
Question	How many objects are created in the following declaration? <code>String[] names = new String[10];</code>
A	0
B	1
C	10
D	11
E	None of the above
Explanation	The declaration introduces a new variable called "names" and initializes it to a newly created array object. This array object is the only object that is created. Remember that when you create an array object that holds references to other objects, all of the references in the array are initially null. The "new" expression used here creates the array only, not any of the <code>String</code> objects that may (eventually) be held in the array. The array is initially completely empty.

Field	Value
ID	632880 [created: 2013-06-11 07:41:34, author: crjrc (xchris), avg difficulty: 1.0000]
Question	We say indexing is fast if it's done in $O(1)$ time, searching is fast if done in $O(\lg N)$ time, and inserting and deleting are fast if done in $O(1)$ time. Compared to other data structures, unsorted linked lists offer:
A	slow indexing, slow search, slow insertions and deletions.
B	fast indexing, fast search, slow insertions and deletions.
C	fast indexing, slow search, slow insertions and deletions.
D	slow indexing, slow search, fast insertions and deletions.
E	slow indexing, fast search, fast insertions and deletions.
Explanation	Linked lists do not support fast indexing. To get at element i , one must traverse the list i steps. Slow indexing makes for slow searching, as the binary search relies upon fast indexing to retrieve the middle element. Insertions and deletions, on the other hand, can be done in constant time, as only one or two neighboring links are affected.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, TopicWG-ADT-List-Implementations, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium,

Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634930 [created: 2013-06-27 08:02:52, author: mikeyg (xmikey), avg difficulty: 0.5000]
Question	<p>Consider the following code snippet that copies elements (pixels) from one 2-d array (called pict), with maximum dimensions of maxWidth and maxHeight into another 2-d array called canvas.</p> <pre> canvas = [] for row in range (0, maxHeight): for col in range (0, maxWidth): origPixel = pict[col][row] canvas[width-1-col][row] = origPixel </pre> <p>If one were to display canvas, how would it compare to the original picture (as represented by pict)?</p>
A	Rotated 180 degrees around the vertical center line/column.
B	Rotated 180 degrees around the horizontal center line/row.
C	Rotated left 90 degrees.
D	Rotated right 90 degrees.
E	Rotated 180 degrees.
Explanation	Each pixel remains on the same row (line) that it originally was on. For any given row, the leftmost pixel swaps positions with the rightmost. The second pixel in a row swaps positions with the second last pixel in that row, etc. Hence, the picture is rotated across the vertical center line.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Michael_Goldweber, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-Why, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Python, Bloom-4-Application, CS1, LinguisticComplexity-2-Medium, CodeLength-lines-00-to-06_Low

Field	Value
ID	634192 [created: 2013-06-24 15:05:44, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What is a shorter way to write <code>if(p == NULL)</code> ?
A	if(p)
B	if(!p)
Explanation	Answer is B.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632312 [created: 2013-06-18 12:34:41, author: kate (xkate), avg difficulty: 1.0000]
Question	An example of something that could be built using a QueueADT is a structure that models:
A	The undo operation in a word processor
B	the back button in a web browser
C	the customers waiting to talk to an online helpdesk
D	a hundred names in alphabetical order, where names are added and removed frequently
E	the roads and intersections in a city
Explanation	<p>Choices A and B are applications where when you delete, you need to delete the item that was added most recently (a LIFO structure). This is not possible in a queue, where you always delete the item that was added *first*.</p> <p>Choice D is an application where you need to be able to delete from the beginning, middle, or end of the structure, something that is also impossible in a queue.</p> <p>Choice E is an application where a element (an intersection) could be connected to several other elements. This is also impossible in a queue.</p>

	Choice C is the only one where it makes sense to retrieve the elements in the order in which they arrived.
Tags	Contributor_Kate_Sanders, ATT-Transition-CSspeak_to_English, Skill-DesignProgramWithoutCoding, TopicWG-ADT-Queue-DefInterfaceUse, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633221 [created: 2013-06-12 06:00:22, author: crjjrc (xchris), avg difficulty: 0.6667]
Question	This sorting algorithm splits the collection into two halves, sorts the two halves independently, and combines the results.
A	selection sort
B	insertion sort
C	bubble sort
D	quick sort
E	merge sort
Explanation	Merge sort splits the collection, sorts the two halves, and merges them.
Tags	Contributor_Chris_Johnson, ATT-Transition-English_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633243 [created: 2013-06-13 00:03:42, author: crjjrc (xchris), avg difficulty: 1.3333]
Question	Locating a new node's insertion point in a binary search tree stops when
A	We reach a null child.
B	We find a node greater than the node to be inserted.
C	We reach the tree's maximum level.
D	We find a node lesser than the node to be inserted.
E	We find a node without any children.
Explanation	Finding nodes less than or greater than the new node happens frequently as we traverse the tree. Tree's don't have maximum levels. The insertion point isn't necessarily a leaf node. The remaining option of stopping when we reach null is the correct answer because we have found the new node's parent node.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-4-Application, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634173 [created: 2013-06-24 14:32:36, author: patitsas (xelizabeth), avg difficulty: 0.6667]
Question	What are hash functions not used for? (Or at least, should not be used for.)
A	Storing values in hash tables
B	Checking file integrity
C	Encrypting passwords
D	Digital signatures on files
Explanation	Hash functions should be used to store passwords, but not to encrypt them!
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-2-Medium, TopicWG-ChoosingAppropriateDS, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable

Field	Value
ID	617508 [created: 2013-05-17 12:13:21, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	How many objects are created in the following declaration? <code>String name;</code>
A	0
B	1
C	This declaration causes a run-time error
D	It is not legal to write this declaration in Java
Explanation	This declaration defines a new name, but does not initialize the name to a value. No objects are created, since "new" is not used to create any. Since the new name is not initialized, it will be null until it is assigned a new value later in the code.

Field	Value
ID	634194 [created: 2013-06-24 15:11:37, author: patitsas (xelizabeth), avg difficulty: 0.5000]
Question	Nathan is on the run (apparently the US is about to invade Canada). He needs to grab food. Each piece of food around him has a nutritional value, and a weight. He wants to put the most calories in his backpack, but it can only hold up to certain weight. What should he optimize for when deciding which foods to bring?
A	The value of food
B	The value / weight ratio of food
C	The weight / value ratio of food
D	The weight of food
Explanation	Greedy approach to fractional knapsack.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-2-Medium, Bloom-1-Knowledge, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable

Field	Value
ID	629973 [created: 2013-06-11 11:51:09, author: kate (xkate), avg difficulty: 1.0000]
Question	Suppose you are defining a Java <code>ProductItem</code> class to store information about the inventory in a store, and you want to give the class an instance variable for the price of that item. Which of the following is the best datatype for the instance variable that models the price?
A	<code>double</code>
B	<code>float</code>
C	<code>int</code>
D	<code>String</code>
E	a user-defined <code>Money</code> class
Explanation	Arguments can be made for any of these choices (except perhaps "int"). I would give <code>Money</code> an edge, because a user-defined class allows you to write methods to display the value properly, do arithmetic on it, and perhaps convert it to different currencies. But I'm going to tag this as a question with more than one answer.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, ATT-Type-How, Skill-WriteCode_MeansChooseOption, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-5-Synthesis, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-NotApplicable, MultipleAnswers-See-Explanation, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634905 [created: 2013-05-22 13:20:27, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public class FirstApp extends wheels.users.Frame { 2. private wheels.users.Ellipse _ellipse; 3. </pre>

```

4.    public FirstApp() {
5.        _ellipse = new wheels.users.Ellipse();
6.    }
7.
8.    public static void main(String[] args) {
9.        FirstApp app = new FirstApp();
10.    }
11.}

```

What does line 2 accomplish (cause to happen)?

A	<code>wheels.users.Ellipse</code> is given <code>_ellipse</code> as an alias
B	An invisible <code>Ellipse</code> is drawn on the screen
C	<code>_ellipse</code> is declared as a <code>wheels.users.Ellipse</code>
D	<code>wheels.users.Ellipse</code> is set to be a <code>private</code> object
E	<code>_ellipse</code> is instantiated as a <code>wheels.users.Ellipse</code>
Explanation	Remember that in Java we need to declare variables, and then instantiate them (using new). Line 2 is simply a declaration -- the variable gets instantiated (in line 5) when a FirstApp gets instantiated.
Tags	ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, Difficulty-1-Low, Language-Java, CS1, CodeLength-lines-06-to-24_Medium, Neo-Piaget-3-Concrete_Operational, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632876 [created: 2013-06-11 07:14:25, author: crjirc (xchris), avg difficulty: 1.5000]
Question	We say indexing is fast if it's done in $O(1)$ time, searching is fast if done in $O(\lg N)$ time, and inserting and deleting are fast if done in $O(1)$ time. Compared to other data structures, unsorted arrays offer:
A	slow indexing, slow search, slow insertions and deletions.
B	fast indexing, fast search, slow insertions and deletions.
C	fast indexing, slow search, slow insertions and deletions.
D	slow indexing, slow search, fast insertions and deletions.
E	slow indexing, fast search, fast insertions and deletions.
Explanation	Unsorted arrays can be indexed in constant time (which is fast), searched in $O(N)$ time (which is not as good as $O(\lg N)$), and restructured in $O(N)$ time (which is not as good as $O(1)$ time).
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicWG-ChoosingAppropriateDS, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634933 [created: 2013-06-19 18:01:36, author: xrobert (xrobert), avg difficulty: 0.5000]
Question	One of the things in Java that allows us to use polymorphism is that the declared type and actual type of a variable may be different. In Java, the actual type of a parameter or variable's value can be any concrete class that is
A	the same as the declared type, or any subclass of the declared type (if the declared type is a class)
B	any class that <code>implements</code> the declared type (if the declared type is an interface)
C	any subclass of a class that <code>implements</code> the declared type (if the declared type is an interface)
D	A, B, and C above.
E	A and B above, but not C
Explanation	The rule of thumb is that the declared type is the same or more abstract than the actual type. If the declared type is a class, the things that are equally or less

	<p>abstract are its descendants -- a subclass specializes a class. If declared type is an interface, it is an abstraction of any class that implements it, or by the relationship between classes and its descendants, any class that is a subclass of something that implements it.</p> <p>Java wants a guarantee that the actual type will have the declared type's methods. That can be via inheritance or implementing an interface, or a combination of the two.</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Robert_McCartney, ATT-Type-How, TopicSimon-DataTypesAndVariables, Language-Java, CS1, TopicSimon-MethodsFuncsProcs, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632218 [created: 2013-06-18 02:27:33, author: kate (xkate), avg difficulty: 0.0000]
Question	An example of something that could be implemented using a Stack is:
A	The undo operation in Word
B	The back button in a web browser
C	A postfix calculator
D	All of the above
E	Items (A) and (B) only
Explanation	Anytime you're solving a problem where you're adding and removing data and you always need to remove the item that was added most recently is suited to a Stack. This is called a last-in-first-out property, or LIFO. Back buttons, the undo operation, and postfix calculators all have the last-in-first-out property.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-DefInterfaceUse, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-5-Synthesis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630951 [created: 2013-06-13 11:36:50, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Suppose you are writing software for a helpdesk. Each request is entered into the system as it arrives.</p> <p>Which of the following abstract datatypes would be the best choice to ensure that the requests are handled in exactly the same order in which they arrive?</p>
A	A Stack
B	A Queue
C	A List
D	A PriorityQueue
E	A Dictionary
Explanation	A Queue is the only abstract datatype where elements are removed in exactly the same order that they arrived in.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	617450 [created: 2013-05-20 16:46:26, author: alr (xandrew), avg difficulty: 1.0000]
Question	If an inorder traversal of a complete binary tree visits the nodes in the order ABCDEF (where each letter is the value of a node), which order are the nodes visited during an postorder traversal?
A	ABDECF
B	DEBFCA
C	DBFACE
D	DBACFE
E	ACBEFD

Field	Value
ID	633269 [created: 2013-06-21 08:45:36, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What is not true about a binary search tree?
A	It is a binary tree
B	It is a perfect tree
C	The leftmost node is the smallest node in the tree
D	When printed with inorder traversal, it will be sorted
Explanation	BSTs need not be perfect.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, TopicWG-Trees-Other, TopicWG-Trees-Search-NotBalanced

Field	Value
ID	632266 [created: 2013-06-18 10:10:29, author: kate (xkate), avg difficulty: 0.5000]
Question	Suppose you are trying to choose between an array and a singly linked list to store the data in your Java program. Which arguments would correctly support one side or the other?
A	Linked lists are better suited to a program where the amount of data can change unpredictably.
B	Arrays provide more efficient access to individual elements.
C	Linked lists provide more efficient access to individual elements.
D	A and B only
E	A, B, and C
Explanation	Array elements can be accessed in constant time, but access to an element of a linked list is $O(n)$, so B is correct and C is incorrect. A is also correct, because arrays require you to guess how much memory will be needed and set aside a fixed amount, while linked lists use memory as needed for the data that are being stored. Since A and B are correct and C is not, the answer is D.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-WriteCode_MeansChooseOption, ATT-Type-Why, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Language-none-none-none, Bloom-6-Evaluation, LinguisticComplexity-2-Medium, CS2, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633398 [created: 2013-06-19 07:59:17, author: crjirc (xchris), avg difficulty: 1.5000]
Question	The insertion sort operates by maintaining a sorted list. When a new element is added, we traverse the list sequentially until we find the new element's appropriate location. Suppose instead that the new location was found using a binary search instead of a sequential search. What is the complexity of this new binary insertion sort?
A	$O(N)$
B	$O(\log N)$
C	$O(N + \log N)$
D	$O(N * \log N)$
E	$O(N^2)$
Explanation	The binary search will indeed speed up finding the location of the newly added object. However, we still have the problem of shifting all subsequent elements. This algorithm, like the regular insertion sort, is $O(N^2)$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-3-Relations, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicWG-Sorting-Quadratic, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634936 [created: 2013-06-27 05:27:33, author: mikeyg (xmikey), avg difficulty: 0.5000]
Question	For the binary search algorithm implemented on a sorted list stored in an array, what is its running time?
A	$O(1)$
B	$O(\log_2 n)$
C	$O(n)$
D	$O(n \log_2 n)$
E	$O(n^2)$
Explanation	Binary search repeatedly "throws away" half of the list still under investigation when looking for a given value in the list. Hence the run time of the algorithm is the number of times a values can be divided in two, until one reaches the value 1: $O(\log_2 n)$
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-Why, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicWG-Searching-Binary

Field	Value
ID	633218 [created: 2013-06-12 05:29:11, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	<p>Suppose we're modeling a person with just name and age. The notation {"Javier", 31} refers to a 31-year-old named Javier. Now, suppose we have this collection of five people:</p> <p>{"Lupe", 29}</p> <p>{"Dean", 29}</p> <p>{"Lars", 28}</p> <p>{"Javier", 31}</p> <p>{"Di", 28}</p> <p>Which of the following ordered collections is the result of applying a <i>stable</i> sort to this collection, where the sorting criteria orders by age?</p>
A	<p>{"Javier", 31}</p> <p>{"Dean", 29}</p> <p>{"Lupe", 29}</p> <p>{"Di", 28}</p> <p>{"Lars", 28}</p>
B	<p>{"Javier", 31}</p> <p>{"Lupe", 29}</p> <p>{"Dean", 29}</p> <p>{"Lars", 28}</p> <p>{"Di", 28}</p>
C	<p>{"Lars", 28}</p> <p>{"Di", 28}</p> <p>{"Dean", 29}</p> <p>{"Lupe", 29}</p> <p>{"Javier", 31}</p>
D	<p>{"Lars", 28}</p> <p>{"Di", 28}</p> <p>{"Dean", 29}</p> <p>{"Lupe", 29}</p> <p>{"Javier", 31}</p>
E	<p>{"Di", 28}</p> <p>{"Lars", 28}</p> <p>{"Dean", 29}</p> <p>{"Lupe", 29}</p> <p>{"Javier", 31}</p>

Explanation	A stable sort preserves the relative order of elements with the same keys. Thus, Lupe must appear before Dean and Lars must appear before Di. Only the correct answer maintains this order.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632268 [created: 2013-06-18 10:16:50, author: kate (xkate), avg difficulty: 0.0000]
Question	Which data structure provides direct access to elements using indexes?
A	an array
B	a linked list
C	both
D	neither
Explanation	If you declare an array in languages that have them, such as Pascal, C, C++, Java, etc., you can access an element of the array by giving the index of the value to be retrieved.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-0-WWWWWW, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632247 [created: 2013-06-18 08:44:55, author: kate (xkate), avg difficulty: 0.0000]
Question	The StackADT 's pop operation:
A	adds a new item at the bottom of the Stack
B	returns without removing the top item on the Stack
C	removes and returns the top item on the Stack
D	adds a new item at the top of the Stack
E	returns true if the Stack is empty and otherwise false
Explanation	"pop" is the traditional term for removing an element from a stack. By definition, the element removed from a stack is always the one that was added most recently, or the one at the "top."
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-DefInterfaceUse, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632315 [created: 2013-06-18 12:44:36, author: kate (xkate), avg difficulty: 0.0000]
Question	The dequeue operation:
A	adds a new item at the front of a queue
B	returns without removing the item at the front of a queue
C	removes and returns the item at the front of a queue
D	adds a new item at the end of a queue
E	returns true if a queue is empty and otherwise false
Explanation	dequeue is the name for the operation that removes an element from a queue. Specifically, it removes the item that was added <i>*first*</i> (just as the first person in a line gets served first).

Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, TopicWG-ADT-Queue-DefinterfaceUse, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	632174 [created: 2013-06-17 23:50:06, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>What does this function do?</p> <pre>void iFunction(char sz[]) { int iLen = 0; while (sz[iLen]) sz[iLen++] = '-'; }</pre>
A	Copies a string
B	Finds and returns a character in a string
C	Replaces all letters in a string with - characters
D	Finds the length of a string
E	Finds and returns the end of a string
Explanation	The Function iterates through the array to the end, replacing each character with the "-" character
Tags	Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632095 [created: 2013-06-17 20:34:00, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	<p>What will be printed?</p> <pre>public static void main(String [] args){ int[] array = {1, 2, 3, 4, 1, 2, 3, 4}; System.out.print(specialSum(array, 3)); } public static int specialSum (int[] integerArray , int index){ int sum = index % 2 == 0 ? integerArray [index]*2 : integerArray [index] +1; if(index == 0) return sum; return sum + specialSum(integerArray, index-1); }</pre>
A	16
B	32
C	15
D	30

Field	Value
ID	635077 [created: 2013-06-30 10:54:59, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this code segment:</p> <pre>boolean x = false; boolean y = true; boolean z = true;</pre>

	<pre>System.out.println((x !y) && (!x z));</pre> <p>What value is printed?</p>
A	true
B	false
C	Nothing, there is a syntax error
Explanation	Since x is false and y is true, (x !y) is false. This forces the entire expression to be false, because of the && operator.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632165 [created: 2013-06-17 23:32:51, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What is output by the code shown in the question below. Think about it carefully - it may be a bit tricky!</p> <pre>void main(void) { static int aiTable[10] = {0,1,2,3,4,5,6,7,8,9}; int i; for(i = 0; i < 10; i++) { if(!(aiTable[i] % 2)) printf("%d", aiTable[i]); } }</pre>
A	02468
B	13579
C	01234
D	56789
E	0123456789
Explanation	<p>Modulus is the remainder of integer division of two numbers with the result placed somewhere.</p> <p>The modulus function of a and b, a being the dividend and b being the divisor, is a - int(a/b) * b.</p> <p>For example, using integer results...</p> <p>47/4 = 11 47%4 = 3</p> <p>Check it: 47 = 11*4 + 3</p> <p>Source http://wiki.answers.com/Q/What_is_the_difference_between_division_and_modulus_in_%27C%27_language</p> <p>In this case the negatively phrased line of code "if(!(aiTable[i] % 2))" is an alternative way of expressing the more common phrasing of a modulus arithmetic expression as given below</p> <p>If you wanted to know if a number was odd or even, you could use modulus to quickly tell you by asking for the remainder of the number when divided by 2.</p> <pre>#include <iostream> using namespace std; int main() { int num; cin >> num;</pre>

	<pre>// num % 2 computes the remainder when num is divided by 2 if (num % 2 == 0) { cout << num << " is even "; } return 0; }</pre> <p>The key line is the one that performs the modulus operation: "num % 2 == 0". A number is even if and only if it is divisible by two, and a number is divisible by another only if there is no remainder.</p> <p>source: http://www.cprogramming.com/tutorial/modulus.html</p>
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium

Field	Value
ID	631460 [created: 2013-06-15 08:50:28, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	In Java, which of the following is not considered to be part of the signature of a method?
A	Return type
B	Method name
C	Number of parameters
D	Types and order of parameters
E	All of the above are part of the signature
Explanation	In Java the return type is not considered as part of the signature. Why should I care? If I want to use method overloading (have different methods with the same name) the methods must have unique signatures, and so I cannot have 2 methods with the same name that have the same number, type, and order of parameters that differ on return type.
Tags	Contributor_Robert_McCartney

Field	Value
ID	631458 [created: 2013-06-15 08:20:29, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the code</p> <pre>int x = 27; int y = 12;</pre> <p>What is the value of the expression <code>x%y</code> ?</p>
A	2
B	2.25
C	3
D	3.0
E	None of the above.
Explanation	In Java, the % operator means "remainder." So this question is asking, "What is the remainder when you divide 27 by 12?" $27 - (2 \times 12) = 3$, so the answer is 3.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
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ID	631452 [created: 2013-06-15 07:26:33, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the code</p> <pre>int x = 27; int y = 12;</pre> <p>What is the value of the expression x/y ?</p>
A	2
B	2.25
C	3
D	3.0
E	None of the above.
Explanation	In Java, when we divide one int value by another, we get another integer. You can start by doing the usual division (which would give you 2.25 in this case) and then remove the decimal part.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633244 [created: 2013-06-13 00:05:32, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Suppose you have a binary search tree with no right children. Furthermore, key A is considered greater than key B if $A.compareTo(B) \geq 0$. Which of the following explains how this tree may have ended up this way?
A	It was filled in ascending order.
B	The root value was the minimum.
C	All keys were identical.
D	The tree is a preorder tree.
E	It was filled in descending order.
Explanation	If the greatest node was inserted first, with each successive node having a lesser key than its predecessor, we'd end up with all left children. Adding nodes with identical keys produces right children.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicWG-Trees-Search-NotBalanced

Field	Value
ID	634934 [created: 2013-06-27 07:19:07, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	<p>What is the logic error in the following implementation of sequential search?</p> <pre>1 def sequentialSearch(listOfValues): 2 target = input("value searching for: ") 3 listSize = len(listOfValues) 4 targetFound = False 5 targetLocation = 0 6 current = 0 7 while (current < listSize): 8 if (listOfValues[current] == target): 9 targetFound = True 10 targetLocation = current 11 else:</pre>

	<pre> 12 targetFound = False 13 current = current + 1 14 if targetFound: 15 print "the target was found at location: ", targetLocation 16 else: 17 print "target was not found" </pre>
A	Line 10
B	Line 7
C	Lines 11-12
D	Line 8
E	None of the above.
Explanation	The else clause resets <i>targetFound</i> if a match is ever found. Hence, in effect, with this else clause present, only the test with the last element in the list is "remembered."
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, TopicWG-Searching, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium

Field	Value
ID	633255 [created: 2013-05-25 08:56:37, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following lines of code will correctly read in the integer value foo?
A	scanf("%d", &foo);
B	scanf("%f", foo);
C	scanf("%f", &foo);
D	scanf("%f\n", foo);
Explanation	(A) is the correct answer; %d is used for reading in integers. The \n in (D) is unnecessary. Finally, scanf requires a pointer to a variable's address -- hence the ampersand.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632102 [created: 2013-06-17 20:40:05, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	A printer is shared among several computers in a network. Which data structure is proper to keep the sent prints in order to provide service in turn?
A	Queue
B	Stack
C	Single Linked List
D	one dimensional array

Field	Value
ID	632101 [created: 2013-06-17 20:38:58, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Java virtual machine handles a chain of method calls. Which data structure is proper for this purpose?
A	Queue
B	Stack

C	single linked list
D	one dimensional array

Field	Value
ID	633250 [created: 2013-06-18 07:36:13, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	Removing a node from a heap is
A	$O(1)$
B	$O(\log N)$
C	$O(N)$
D	$O(N \log N)$
E	$O(N^2)$
Explanation	The last node is moved into the empty spot, which may be the root, and it may trickle back down to the bottom level. The performance is based on the number of levels in the tree. As heaps are balanced, the performance is $O(\log N)$.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

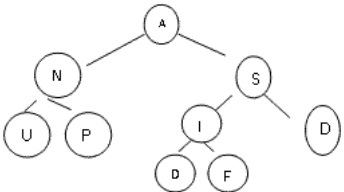
Field	Value
ID	632099 [created: 2013-06-17 20:37:58, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	We need to keep track of the changes that a user makes when working with a word processor. Which data structure is more proper for this purpose?
A	Queue
B	Stack
C	Single Linked List
D	one dimensional array

Field	Value
ID	631283 [created: 2013-06-11 11:11:06, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you have a list of numbers stored in consecutive locations in a Java array. What is the worst-case time complexity of finding a given element in the array using linear search?
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n \log n)$
E	$O(n^2)$
Explanation	Linear search is $O(n)$.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632108 [created: 2013-06-17 20:45:53, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which data structure has a better performance when customer offers needs to be stored/restored for an auction?

A	An array
B	A single linked list
C	A priority queue
D	A tree

Field	Value
ID	634201 [created: 2013-06-24 15:26:03, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Noor writes a program in C to evaluate some Taylor series, to help her with her calculus homework. She remembers to <code>#include<math.h></code> before calling the <code>pow</code> function. But when she compiles with <code>gcc taylor.c</code> , she gets an error that <code>pow</code> is undefined. What she should instead type in the command-line to compile successfully?
A	<code>gcc taylor.c -01</code>
B	<code>gcc taylor.c -lm</code>
C	<code>gcc taylor.c -math</code>
D	<code>gcc taylor.c -o taylor</code>
Explanation	-lm will manually link the math library.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-2-Medium, TopicSimon-ClassLibraries, Language-C, Bloom-1-Knowledge, CS2, LinguisticComplexity-2-Medium, CodeLength-lines-00-to-06_Low

Field	Value
ID	632109 [created: 2013-06-17 20:49:30, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What node will be visited after A in a preorder traversal of the following tree? 
A	S
B	D
C	N
D	I

Field	Value
ID	632473 [created: 2013-06-19 04:51:50, author: kate (xkate), avg difficulty: 1.0000]
Question	<pre>public int factorial (int n) { if (n == 0) return 1; else if (n > 0) return n * factorial(n - 1); else return -1; // invalid input }</pre> <p>The Big-Oh time complexity of this method is:</p>
A	O(1)

B	$O(\log n)$
C	$O(n)$
D	$O(n^2)$
E	none of the above
Explanation	The factorial method will be called n times, so the time complexity is proportional to n.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	632065 [created: 2013-06-17 08:56:09, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Assuming "FRED" is an ASCII text file which opens correctly, what will be displayed by this code?</p> <pre>#define MAX 128 FILE *pFile = fopen("FRED", "r"); unsigned uCount = 0; while(!feof(pFile)) { char ch; ch = fgetc(pFile); uCount++; } printf("%u", uCount);</pre>
A	The number of characters in the file
B	The number of words in the file
C	The number of sentences in the file
D	The number of lines of text in the file
E	The number of words on the last line of text in the file
Explanation	The function reads the file character by character and increments a counter on each read, the result of which is printed on reaching the end of file giving the total character count in the file
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, CS1

Field	Value															
ID	632063 [created: 2013-06-17 08:48:40, author: tclear (xtony), avg difficulty: 1.0000]															
Question	<p>An array has been declared as shown then used to store the data in the table below.</p> <pre>int iTable[3][5]; /* Declaration */</pre> <table><tr><td>27</td><td>32</td><td>14</td><td>9</td><td>26</td></tr><tr><td>74</td><td>42</td><td>30</td><td>15</td><td>19</td></tr><tr><td>41</td><td>63</td><td>48</td><td>20</td><td>3</td></tr></table> <p>What is the value of iTable [3] [4]?</p>	27	32	14	9	26	74	42	30	15	19	41	63	48	20	3
27	32	14	9	26												
74	42	30	15	19												
41	63	48	20	3												
A	3															
B	B															
C	19															

D	20
E	iTable[3][4] does not exist
Explanation	The index values for the array start from 0 so iTable [3] [4] refers to the 4th row and the 5th column, where the 4th row does not exist for additional explanation cf. http://www.tutorialspoint.com/cprogramming/c_multi_dimensional_arrays.htm
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, Bloom-2-Comprehension, CS1

Field	Value
ID	632007 [created: 2013-06-17 16:27:57, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following is a list of Java class names that are both syntactically legal and obey the standard naming convention?
A	R2D2, Chameleon, public
B	R2D2, Chameleon, Iguana
C	r2d2, chameleon, public
D	R2D2, Iguana, _hello
E	none of the above
Explanation	Choice (b) is correct, because all of the names start with an uppercase letter, followed by 0 or more letters, numbers, and/or underscores.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634948 [created: 2013-06-19 16:43:23, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	<p>When we use recursion to solve a problem, we have</p> <ol style="list-style-type: none"> 1. a problem that contains one or more problems that are similar to itself 2. a version of the problem that is simple enough to be solved by itself, without recursion, and 3. a way of making the the problem simpler so that it is closer to (and ultimately the same as) the version in 2. <p>What is 2. called?</p>
A	The simple case
B	The inductive case
C	The base case
D	The iterative case
E	None of the above
Explanation	Base case is the term we use for the case that is simple enough to solve directly. We probably lifted the term from induction proofs in Mathematics, which is fitting.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Robert_McCartney, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicSimon-Recursion, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634196 [created: 2013-06-24 15:17:53, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>What will the following code output?</p> <pre>int arr[5]; int *p = arr; printf("p is %p -- ", p); ++p; printf("p is %p \n", p);</pre>

A	p is 0x7fffb04846d0 – p is 0x7fffb04846d1
B	p is 0x7fffb04846d0 – p is 0x7fffb04846d2
C	p is 0x7fffb04846d0 – p is 0x7fffb04846d4
D	Segmentation fault
Explanation	p will increase by the sizeof(int) == 4.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632076 [created: 2013-06-16 23:28:41, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>Consider the following short program, which does not meet all institutional coding standards:</p> <pre>void vCodeString(char szText[]); /* First line */ #include <stdio.h> #include <string.h> #define MAX_LEN 12 int main(void) { char szData[MAX_LEN]; printf("Enter some text to code: "); scanf("%s", szData); vCodeString(szData); /* Line 8 */ printf("Coded string is %s\n", szData); } void vCodeString(char szText[]) { int i = -1; while(szText[++i]) { szText[i] += (char)2; } }</pre> <p>With the array size defined as MAX_LEN (or 12) bytes, what happens if I enter a word with more than 12 letters, such as hippopotamuses?</p>
A	You will get a run time error
B	You will get a syntax error from the compiler
C	Other data may be overwritten
D	The array will be enlarged
E	Nothing - it is legal and perfectly normal.
Explanation	<p>Now, C provides open power to the programmer to write any index value in [] of an array. This is where we say that no array bound check is there in C. SO, misusing this power, we can access arr[-1] and also arr[6] or any other illegal location. Since these bytes are on stack, so by doing this we end up messing with other variables on stack. Consider the following example :</p> <pre>#include<stdio.h> unsigned int count = 1; int main(void)</pre>

```
{
int b = 10;
int a[3];
a[0] = 1;
a[1] = 2;
a[2] = 3;
printf("\n b = %d \n",b);
a[3] = 12;
printf("\n b = %d \n",b);
return 0;
}
```

In the above example, we have declared an array of 3 integers but try to access the location arr[3] (which is illegal but doable in C) and change the value kept there. But, we end up messing with the value of variable 'b'. Cant believe it?, check the following output . We see that value of b changes from 10 to 12.

```
$ ./stk
```

```
b = 10
```

```
b = 12
```

Source <http://www.thegeekstuff.com/2011/12/c-arrays/>

Tags	Skill-DebugCode, Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, TopicSimon-Arrays, Block-Vertical-3-Relations, Language-C, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium
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Field	Value
ID	634973 [created: 2013-06-19 11:07:23, author: crjirc (xchris), avg difficulty: 2.0000]
Question	Suppose all of the computer's memory is available to you, and no other storage is available. Every time your array is filled to its capacity, you enlarge it by creating an array twice the size of the original, if sufficient memory is available, and copying over all elements. How large can your growable array get?
A	50% of memory
B	100% of memory
C	25% of memory
D	33% of memory
E	66% of memory
Explanation	When the array consumes 33% of memory and needs to expand, it can do so. The new array will consume 66% of memory. After this, there is not enough room for a larger array.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632122 [created: 2013-06-17 21:06:49, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	Using linear probing and following hash function and data, in which array slot number 31 will be inserted*? $h(x) = x \bmod 13$ 18, 41, 22, 44, 59, 32, 31, 73 *credit goes to Goodrich et. al. (Data Structures & Algorithms in Java)
A	5

B	6
C	8
D	10

Field	Value
ID	632094 [created: 2013-06-14 23:41:26, author: tclear (xtony), avg difficulty: 0.0000]
Question	Which of the following is NOT a fundamental data type in C?
A	int
B	float
C	string
D	short
E	char
Explanation	A String is not a primitive data type. It can be thought of as an array of characters.
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, CodeLength-NotApplicable

Field	Value
ID	631928 [created: 2013-06-17 11:12:01, author: kate (xkate), avg difficulty: 0.0000]
Question	After the assignment statement <pre>String word = "entropy";</pre> what is returned by <pre>word.substring(word.length());</pre>
A	"entropy"
B	"y"
C	the empty <code>String</code>
D	an error
E	none of the above
Explanation	<code>word.substring(n)</code> returns the substring of <code>word</code> that starts at index <code>n</code> and ends at the end of the <code>String</code> . If index <code>n</code> is greater than the index of the last character in the <code>String</code> , as it is here, <code>substring</code> simply returns the empty <code>String</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	632567 [created: 2013-06-19 13:49:48, author: kate (xkate), avg difficulty: 0.0000]
Question	The worst-case time complexity of quicksort is:
A	$O(1)$
B	$O(n)$
C	$O(n \log n)$
D	$O(n^2)$
E	none of the above
Explanation	In the worst case, every time quicksort partitions the list, it is divided into two parts, one of size 0 and one of size $n-1$ (plus the pivot element). This would happen, for

	<p>example, if all the elements in the list are equal, or if the list is already sorted and you always choose the leftmost element as a pivot.</p> <p>Quicksort would have to partition the list n times, because each time the pivot element is the only one that gets put in place. The first time quicksort compares the pivot element with all $n-1$ other elements. The second time, quicksort compares the new pivot with $n-2$ other elements, and so forth down to $n - (n-1)$. So it does work proportional to $1+2+3+\dots+(n-1)$, or $n(n-1)/2$.</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632479 [created: 2013-06-19 05:15:38, author: kate (xkate), avg difficulty: 0.0000]
Question	The time complexity of linear search is:
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(2^n)$
E	none of the above
Explanation	The time required for linear search in the worst case is directly proportional to the amount of data.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Searching-Linear, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634979 [created: 2013-06-26 09:04:40, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	An NP-Complete problem is:
A	solvable, and the best known solution runs in polynomial time (i.e. feasible)
B	solvable, and the best known solution is not feasible (i.e. runs in exponential time)
C	currently unsolvable, but researchers are hoping to find a solution.
D	provably unsolvable: it has been shown that this problem has no algorithmic solution.
Explanation	NP-Complete problems typically have rather simplistic algorithmic solutions. The problem is that these solutions require exponential time to run.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, CS1, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632755 [created: 2013-06-20 02:07:50, author: ray (ray), avg difficulty: 1.0000]
Question	<p>The following is a skeleton for a method called "maxVal":</p> <pre> public static int maxVal(int[] y, int first, int last) { /* This method returns the value of the maximum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; xxx missing for loop goes here return bestSoFar; } // method maxVal </pre>

	In this question, the missing "for" loop is to run "backwards". That is, the code should search the array from the high subscripts to the low subscripts. Given that, the correct code for the missing "for" loop is:
A	<pre>for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { bestSoFar = y[i]; } // if } // for</pre>
B	<pre>for (int i=first+1; i<=last; i++) { if (y[i] > y[bestSoFar]) { bestSoFar = y[i]; } // if } // for</pre>
C	<pre>for (int i=last; i>first; i--) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for</pre>
D	<pre>for (int i=last; i>first; i--) { if (bestSoFar < y[i]) { bestSoFar = y[i] } // if } // for</pre>
E	<pre>for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) { bestSoFar = i; } // if } // for</pre>
Explanation	<p>a)</p> <p>INCORRECT:</p> <p>if (y[i] < y[bestSoFar]) ... This is setting bestSoFar to the value of the SMALLEST number so far.</p> <p>b)</p> <p>INCORRECT:</p> <p>The loop starts at first+1 ... This loop is not running backwards.</p> <pre>if (y[i] > y[bestSoFar]) ... bestSoFar is storing a value, not a position.</pre> <p>c)</p> <p>INCORRECT</p> <pre>bestSoFar = i; ... bestsoFar is being set to the position, not the value.</pre> <p>d)</p> <p>CORRECT!</p> <p>e)</p> <p>INCORRECT:</p> <p>The loop starts at first+1 ... This loop is not running backwards.</p> <pre>bestSoFar = i; ... bestsoFar is being set to the position, not the value.</pre>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium

Field	Value
ID	632128 [created: 2013-06-13 23:22:23, author: tclear (xtony), avg difficulty: 0.0000]
Question	What would the following line of code do with a form named frmMain? frmMain.Caption = txtName.Text
A	Make the text "txtName" appear as the caption of the form.
B	B Execute the method Caption, passing txtName as a parameter.
C	Change the contents of the text box txtName to the caption of the form.
D	Change the caption of the form to the contents of the text box txtName.
E	Generate a run time error. It is not possible to alter the caption of a form at run time.
Explanation	The code assigns the contents of the text box to the caption for the form
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, TopicSimon-GUI-Design-Implementat, Language-VB, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	632807 [created: 2013-05-24 09:21:17, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Which one of the following methods should be made static ? <pre> public classClazz { private final int num = 10; double a() { System.out.println(num); return c(); } void b() { System.out.println(this); } double c() { double r = Math.random(); System.out.println(r); return r; } void d() { a(); a(); } int e() { return num; } } </pre>
A	a
B	b
C	c
D	d
E	e
Explanation	Method c() does not depend on the invoking instance or its instance variables.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_CSspeak, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	635071 [created: 2013-06-30 10:26:41, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	<p>What output will the following code fragment produce?</p> <pre> public void fn() { int grade = 91; int level = -1; if (grade >= 90) if (level <= -2) System.out.println("A-level"); else System.out.println("B-status"); } </pre>
A	A-level
B	B-status
C	"A-level"
D	"B-status"
E	no output is produced
Explanation	Despite the indentation, no braces appear around the body of either if statement's branch(es). As a result, the else is associated with the second (inner) if. Since the outer if statement's condition is true, but the inner if statement is false (and it has no else branch), no output is produced.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635051 [created: 2013-06-30 01:32:44, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	<p>What output will the following code fragment produce?</p> <pre> public void fn() { int grade = 81; int level = -3; if (grade >= 90) if (level <= -2) System.out.println("A-level"); else System.out.println("B-status"); } </pre>
A	A-level
B	B-status
C	"A-level"
D	"B-status"
E	no output is produced
Explanation	Despite the indentation, no braces appear around the body of either if statement's branch(es). As a result, the else is associated with the second (inner) if. Since the outer if statement's condition is false, no output is produced.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635050 [created: 2013-06-30 01:35:51, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	What output will the following code fragment produce?

	<pre> public void fn() { int grade = 81; int level = -1; if (grade >= 90) if (level <= -2) System.out.println("A-level"); else System.out.println("B-status"); } </pre>
A	A-level
B	B-status
C	"A-level"
D	"B-status"
E	no output is produced
Explanation	Despite the indentation, no braces appear around the body of either if statement's branch(es). As a result, the else is associated with the second (inner) if. Since the outer if statement's condition is false, no output is produced.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635014 [created: 2013-06-29 21:50:13, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Consider the struct:</p> <pre> struct book{ char title[50]; int isbn; }; </pre> <p>Assuming no address padding, what will <code>sizeof(struct book)</code> return?</p>
A	12
B	54
C	50
D	204
E	8
Explanation	sizeof(the array) + sizeof(the int) = 50 + 4.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Recs-Structs-HeteroAggs, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635008 [created: 2013-06-29 22:24:31, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>What will this code output on 64-bit Linux?</p> <pre> char vals[10]; printf("%d\n", sizeof(vals + 0)); </pre>

A	1
B	4
C	8
D	10
E	80
Explanation	Size of the pointer.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618655 [created: 2013-05-28 21:17:05, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	A compiler error existed in this code. Why is that happening? <pre>public class test { int testCount; public static int getCount(){ return testCount; } public test(){ testCount ++; } }</pre>
A	testCount has not been initialized.
B	testCount has never been used.
C	testCount as a non-static variable cannot be referenced in a static method such as getCount() .
D	testCount's access modifier is not public.

Field	Value
ID	634963 [created: 2013-06-13 12:01:34, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following choices would best be modeled by a class, followed by an instance of that class?
A	Country, Sweden
B	Sweden, Country
C	Country, ScandinavianCountry
D	Sweden, Norway
E	Sweden, Linnaeus
Explanation	Choice B is wrong because the items listed are object, class, not class, object. Choice C is wrong, because the items listed are class, subclass, not class, object. Choices D and E are wrong because in each case, the items listed are both concrete objects.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Bloom-2-Comprehension, Language-none-none-none, CS1, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value

ID	635032 [created: 2013-06-29 23:25:10, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The following method, called <code>maxRow()</code>, is intended to take one parameter: a <code>List</code> where the elements are <code>List</code>'s of <code>Integer</code> objects. You can think of this parameter as a matrix—a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 8 so that this method works as intended:</p> <pre> public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 } </pre>
A	<code>maxSum</code>
B	<code>maxVec</code>
C	<code>sum</code>
D	<code>row</code>
E	<code>col</code>
Explanation	The local variable <code>maxSum</code> is used to keep track of the maximum row sum seen so far, as the outer loop progresses across all rows in the matrix. The inner loop computes the sum of all cells in the current row, which is stored in the local variable <code>sum</code> . If the current row's sum is larger than the maximum seen so far, the variable <code>maxSum</code> should be updated to be <code>sum</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	635047 [created: 2013-06-30 01:20:39, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Given the following Java class declaration:</p> <pre> public class T2int { private int i; public T2int() { i = 0; } public T2int(int i) { this.i = i; } public int get() { return i; } } </pre> <p>The following method, called <code>rangeSum()</code>, is intended to take three parameters: a <code>List</code> of <code>T2int</code> objects, plus the <code>low</code> and <code>high</code> end of a range within the list. The method computes the sum of the values in the <code>List</code> that are within the "range" (but not including the range end values). Choose the best choice to fill in the blank on Line 8 so that the method will work as intended:</p>

```

public int rangeSum(List<T> list, int low, int high)
{
    int num = 0;           // Line 1
    int sum = 0;           // Line 2

    for (int idx = 0; idx < list.size(); idx++) // Line 3
    {
        int ival = list.get(idx).get();        // Line 4
        if (_____)                            // Line 5
        {
            num++;                             // Line 6
            sum = _____;                  // Line 7
        }
    }
    return _____;                        // Line 8
}

```

A	<input type="text" value="sum"/>
B	<input type="text" value="num"/>
C	<input type="text" value="ival"/>
D	<input type="text" value="idx"/>
E	<input type="text" value="list.get(num)"/>
Explanation	The method should return the sum of all of the list elements that are within the specified range. From examining the body of the loop, it is clear that this value is accumulated in the local variable <input type="text" value="sum"/> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	630792 [created: 2013-06-13 04:41:42, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Consider the following class definition:</p> <pre> import java.util.Scanner; // 1 public class SillyClass2 { // 2 private int num, totalRed, totalBlack; // 3 public SillyClass2 () { // 4 num = 0; // 5 totalRed = 0; // 6 totalBlack = 0; // 7 this.spinWheel(); // 8 System.out.print("Black: " + totalBlack); // 9 System.out.println(" and red: " + totalRed); // 10 } // 11 public void spinWheel () { // 12 Scanner kbd = new Scanner(System.in); // 13 System.out.println("Enter 1 or 0, -1 to quit."); // 14 num = kbd.nextInt(); // 15 while (num >= 0) { // 16 if (num == 0) // 17 totalRed++; // 18 else if (num == 1) // 19 totalBlack++; // 20 else System.out.println("Try again"); // 21 System.out.println("Enter 1 or 0, -1 to quit."); // 22 num = kbd.nextInt(); // 23 } // 24 System.out.println("Thanks for playing."); // 25 } // 26 } // 27 </pre> <p>Which sequence of inputs will cause line 21 to be executed?</p>

A	-1
B	0 1 -1
C	0 1 1 0 -1
D	0 1 2 1 -1
E	1 1 1 0 -1
Explanation	Answers A, B, C, and E are incorrect because they contain no inputs greater than 1. Answer D does contain an input greater than 1, and that input is after a 0 (which causes the loop to be entered) and before the -1 (which causes the loop to be exited).
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-2-Medium, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Testing

Field	Value
ID	618639 [created: 2013-05-28 21:10:43, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which method call is an efficient and correct way of calling methods compute_1 and compute_2 inside main method? <pre>public class test { public static void compute_1(){} public void compute_2(){} public static void main(String [] Args){ } }</pre>
A	<pre>test t = new test(); t.compute_1(); t.compute_2();</pre>
B	<pre>compute_1(); compute_2();</pre>
C	<pre>test.compute_1(); test.compute_2();</pre>
D	<pre>test.compute_1(); test t = new test(); t.compute_2();</pre>

Field	Value
ID	635052 [created: 2013-06-30 01:28:09, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	What output will the following code fragment produce? <pre>public void fn() { int grade = 91; int level = -3; if (grade >= 90) if (level <= -2) System.out.println("A-level"); else System.out.println("B-status"); }</pre>
A	A-level
B	B-status
C	"A-level"

D	"B-status"
E	no output is produced
Explanation	Despite the indentation, no braces appear around the body of either if statement's branch(es). As a result, the else is associated with the second (inner) if. Still, both if statement conditions are true, so the output is A-Level .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	629609 [created: 2013-06-10 09:37:19, author: kate (xkate), avg difficulty: 1.0000]
Question	Suppose you're on a project that is writing a large program. One of the programmers is implementing a Clock class; the other programmers are writing classes that will use the Clock class. Which of the following aspects of the public methods of the Clock class do not need to be known by both the author of the Clock class and the programmers who are using the Clock class?
A	The methods' names
B	The methods' return types
C	The methods' parameter types
D	The method bodies
E	What the methods do
Explanation	This question addresses the principle of encapsulation. All these items must be known to the author of the Clock class. In order to use the class, the other programmers must know what the methods do, and must know their names, parameter types, and return values. The method bodies, on the other hand, are hidden from the users.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Vertical-3-Relations, Bloom-2-Comprehension, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635076 [created: 2013-06-30 10:51:19, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider these two Java methods:</p> <pre> public void fuzzy(int x) { x = 73; System.out.print(x + " "); } public void bunny() { int x = 29; fuzzy(x); System.out.println(x); } </pre> <p>What is printed when bunny() is called?</p>
A	29 29
B	73 73
C	29 73
D	73 29
E	none of these
Explanation	Remember that in Java, parameters are passed by value. Although a method may assign to a parameter, this change only affects the method's local copy of the parameter and is not visible outside the method (i.e., does not affect the actual value passed in by the caller).

Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	635041 [created: 2013-06-29 23:37:25, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Given the following Java class declaration:</p> <pre> public class T2int { private int i; public T2int() { i = 0; } public T2int(int i) { this.i = i; } public int get() { return i; } } </pre> <p>The following method, called <code>rangeSum()</code>, is intended to take three parameters: a <code>List</code> of <code>T2int</code> objects, plus the <code>low</code> and <code>high</code> end of a range within the list. The method computes the sum of the values in the <code>List</code> that are within the "range" (but not including the range end values). Choose the best choice to fill in the blank on Line 5 so that the method will work as intended:</p> <pre> public int rangeSum(List<T2int> list, int low, int high) { int num = 0; // Line 1 int sum = 0; // Line 2 for (int idx = 0; idx < list.size(); idx++) // Line 3 { int ival = list.get(idx).get(); // Line 4 if (_____) // Line 5 { num++; // Line 6 sum = _____; // Line 7 } } return _____; // Line 8 } </pre> <p>A <code>(idx > low) && (idx < high)</code></p> <p>*B* <code>(ival > low) && (ival < high)</code></p> <p>C <code>(list.get(idx) > low) && (list.get(idx) < high)</code></p> <p>D <code>(idx >= low) && (idx <= high)</code></p> <p>E <code>(list.get(idx) >= low) && (list.get(idx) <= high)</code></p> <p>Explanation The local variable <code>ival</code> contains the integer value stored in the current position in the list. To check this value to ensure it is within the desired range, use the condition <code>(ival > low) && (ival < high)</code>.</p> <p>Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low</p>

Field	Value
ID	633553 [created: 2013-06-19 08:34:43, author: crjjrc (xchris), avg difficulty: 2.0000]

Question	What terminates a failed linear probe in a non-full hashtable?
A	The end of the array
B	A deleted node
C	A null entry
D	A node with a non-matching key
E	Revisiting the original hash index
Explanation	A null entry marks the end of the probing sequence. Seeing the end of the array isn't correct, since we need to examine all elements, including those that appear before our original hash index. A node with a non-matching key is what started our probe in the first place. Revisiting the original hash index would mean we looked at every entry, but we could have stopped earlier at the null entry. The purpose of leaving a deleted node in the table is so that probing may proceed past it.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633555 [created: 2013-06-19 08:40:31, author: crjirc (xchris), avg difficulty: 1.0000]
Question	If a hashtable's array is resized to reduce collisions, what must be done to the elements that have already been inserted?
A	All items must be copied over to the same indices in the new array.
B	Nodes must be rehashed and reinserted in the new array.
C	The existing items can be placed anywhere in the new array.
D	The hashCode method must be updated.
Explanation	Since calculating a node's position in the hashtable is a function of the node's key's hashcode and the array size, all items must be reinserted.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, Neo-Piaget-4-Formal_Operational, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value									
ID	635028 [created: 2013-06-29 23:20:56, author: patitsas (xelizabeth), avg difficulty: 1.0000]									
Question	<div>Consider the code below; what value will p have at the end?</div> <div><pre>int *p, i;</pre></div> <div><pre>i = 2; p = &i; *p = 5;</pre></div> <div><pre>i++;</pre></div> <table><thead><tr><th>Variable name</th><th>Variable's address</th><th>Variable's value</th></tr></thead><tbody><tr><td>p</td><td>0x0000123abc</td><td></td></tr><tr><td>i</td><td>0x567def0000</td><td>(withheld)</td></tr></tbody></table>	Variable name	Variable's address	Variable's value	p	0x0000123abc		i	0x567def0000	(withheld)
Variable name	Variable's address	Variable's value								
p	0x0000123abc									
i	0x567def0000	(withheld)								
A	2									
B	5									
C	6									
D	0x567def0000									
E	0x567def0004									
Explanation	The memory address of i; p points to i									

Tags	ATT-Transition-ApplyCSSpeak, Contributor_Elizabeth_Patitsas, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-Lifetime, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	635027 [created: 2013-06-29 23:19:43, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The following method, called <code>maxRow()</code>, is intended to take one parameter: a <code>List</code> where the elements are <code>List</code>s of <code>Integer</code> objects. You can think of this parameter as a matrix—a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 7 so that this method works as intended:</p> <pre> public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 } </pre>
A	<code>sum > matrix.size()</code>
B	<code>sum < maxSum</code>
C	<code>sum <= maxSum</code>
D	<code>sum > maxSum</code>
E	<code>sum > matrix.get(row).size()</code>
Explanation	The local variable <code>sum</code> represents the sum of all cell values in the current row, which is computed by the inner loop in the code. The if test on Line 6 checks whether to update the local variables <code>maxSum</code> and <code>maxVec</code> , which represent information about the largest row sum found so far. This should happen when <code>sum > maxSum</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	618589 [created: 2013-05-28 20:47:32, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which sentence is NOT correct?
A	In a class, you can have a method with the same name as the constructor.
B	In a class, you can have two methods with the same name and return type, but different number and type of input arguments.
C	In a class, you can have two methods with the same number and type of input arguments and different return type.
D	In a class you can have two constructors with the same name.

Field	Value
ID	633401 [created: 2013-06-19 07:42:13, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	You see the expression <code>n = -15</code> in some code that successfully compiles. What type can <code>n</code> not be?

A	int
B	float
C	char
D	short
E	long
Explanation	Chars can only hold integers in [0, 65535]. Assigning an int variable to a char requires an explicit cast. Assigning an int literal in this interval does not require a cast. Assign an int literal outside of this interval is compile error.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633273 [created: 2013-06-21 08:51:32, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	After the assignment <code>signal = 'abracadabra'</code> , what is returned by <code>signal[len(signal)]</code> ?
A	'a'
B	'abracadabra'
C	11
D	an error
E	none of the above
Explanation	This is the classic way to go one character over the edge of a String.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635002 [created: 2013-06-29 22:50:13, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following sorting algorithms has a best-case time performance that is the same as its and worst-case time performance (in big O notation)?
A	Insertion sort
B	Selection sort
C	Bubble sort
D	None of the above
Explanation	Selection sort has both $O(n^2)$ worst and best case.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
ID	633262 [created: 2013-06-18 06:51:45, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	What advantage does using dummy nodes in a linked list implementation offer?
A	Reduced storage needs.
B	Simplified insertion.
C	Easier detection of the list's head and tail.

D	Simplified iteration.
Explanation	Dummy nodes consume a little more space, and they don't simplify iteration or bounds detection any. They do reduce the special casing that would otherwise need to be done when updating forward and backward links on an insertion.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-Why, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, TopicWG-LinkedLists, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618985 [created: 2013-05-29 05:09:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	How many asterisks will be printed as a result of executing this code? <pre>int counter = 0, N = 10; while (counter++ < N){ if (counter%2 == 0) continue; System.out.print("*"); }</pre>
A	none, infinite loop.
B	10
C	5
D	1

Field	Value
ID	635045 [created: 2013-06-30 00:11:07, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Given the following Java class declaration:</p> <pre>public class T2int { private int i; public T2int() { i = 0; } public T2int(int i) { this.i = i; } public int get() { return i; } }</pre> <p>The following method, called <code>rangeSum()</code>, is intended to take three parameters: a <code>List</code> of <code>T2int</code> objects, plus the <code>low</code> and <code>high</code> end of a range within the list. The method computes the sum of the values in the <code>List</code> that are within the "range" (but not including the range end values). Choose the best choice to fill in the blank on Line 7 so that the method will work as intended:</p> <pre>public int rangeSum(List<T2int> list, int low, int high) { int num = 0; // Line 1 int sum = 0; // Line 2 for (int idx = 0; idx < list.size(); idx++) // Line 3 { int ival = list.get(idx).get(); // Line 4 if (_____) // Line 5 sum += ival; } }</pre>

	<pre> { num++; // Line 6 sum = -----; // Line 7 } } return -----; // Line 8 } </pre>
A	<code>sum + ival</code>
B	<code>sum + num</code>
C	<code>sum + idx</code>
D	<code>sum + list.size()</code>
E	<code>sum + 1</code>
Explanation	Since the method computes the sum of all values found, and the local variable <code>sum</code> is used to accumulate this total, sum should be updated to <code>sum + ival</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	633452 [created: 2013-06-21 17:19:09, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	<p>Consider the following Python code:</p> <pre> number = int(input("Enter a positive number: ")) while number > 1: if (number % 2 == 1): number = number * 3 + 1 else: number = number/2 print number if number == 1: break else: print "The end" </pre> <p>Given the input '8', what output is produced by the program?</p>
A	an error
B	'The end'
C	4 2 1
D	4 2 1 The end
E	none of the above
Explanation	Basically just trace the code.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634994 [created: 2013-06-29 22:42:13, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Chris implements a standard sorting algorithm that sorts the numbers 64, 25, 12, 22, 11 like so:

	64 25 12 22 11 11 25 12 22 64 11 12 25 22 64 11 12 22 25 64 11 12 22 25 64 Which sorting algorithm is this?
A	Insertion sort
B	Selection sort
C	Bubble sort
D	Merge sort
Explanation	In the first line, we see the min is pulled from the end of the array so we know it's selection sort.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
ID	618636 [created: 2013-05-28 21:09:34, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	If the following hierarchy of exception is defined by a user, which option is the correct order of catching these exceptions? <pre> class firstLevelException extends Exception{} class secondLevelException_1 extends firstLevelException{} class secondLevelException_2 extends firstLevelException{} class thirdLevelException extends secondLevelException_1{} </pre>
A	A. <pre> try{ //code was removed } catch (firstLevelException e){ e.printStackTrace(); } catch (secondLevelException_1 e){ e.printStackTrace(); } catch (secondLevelException_2 e){ e.printStackTrace(); } catch (thirdLevelException e){ e.printStackTrace(); } </pre>
B	<pre> try{ //code was removed } catch (thirdLevelException e){ e.printStackTrace(); } </pre>

	<pre>catch (secondLevelException_1 e){ e.printStackTrace(); } catch (secondLevelException_2 e){ e.printStackTrace(); } catch (firstLevelException e){ e.printStackTrace(); }</pre>
C	<pre>try{ //code was removed } catch (firstLevelException e){ e.printStackTrace(); } catch (secondLevelException_2 e){ e.printStackTrace(); } catch (secondLevelException_1 e){ e.printStackTrace(); } catch (thirdLevelException e){ e.printStackTrace(); }</pre>
D	<pre>try{ //code was removed } catch (thirdLevelException e){ e.printStackTrace(); } catch (firstLevelException e){ e.printStackTrace(); } catch (secondLevelException_2 e){ e.printStackTrace(); } catch (secondLevelException_1 e){ e.printStackTrace(); }</pre>

Field	Value
ID	633374 [created: 2013-06-19 07:35:33, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	You see the expression <code>n = 47</code> in some code that successfully compiles. What type can <code>n</code> not be? <input type="text"/>
A	int
B	double

C	float
D	byte
E	String
Explanation	Ints cannot be stored in Strings directly.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618656 [created: 2013-05-28 21:17:52, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	Which sentence is NOT correct?
A	If you define a variable as a final, you will never be able to change its.
B	If you define a method as a final, you will never be able to override it.
C	If you define a class as a final, you will never be able to extend it.
D	If you define a class as a final, you will have to mark all its method as a final too.

Field	Value
ID	618648 [created: 2013-05-28 21:13:08, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	<p>What would be the output?</p> <pre> public class test { static int testCount = 0; public test(){ testCount ++; } public static void main(String [] Args){ test t1 = new test(); System.out.println(t1.testCount); test t2 = new test(); System.out.println(t1.testCount + " " + t2.testCount); test t3 = new test(); System.out.println(t1.testCount+ " " + t2.testCount+ " " + t3.testCount); } }</pre>
A	<p>0</p> <p>0 0</p> <p>0 0 0</p>
B	<p>1</p> <p>1 1</p> <p>1 1 1</p>
C	<p>1</p> <p>2 2</p> <p>3 3 3</p>
D	<p>1</p> <p>2 3</p>

4 5 6

Field	Value
ID	635029 [created: 2013-06-29 23:17:11, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	<p>Consider the code below; what value will i have at the end?</p> <pre>int *p, i;</pre> <div> <pre> i = 2; p = &i; *p = 5; i++; </pre> </div>
A	2
B	5
C	6
D	3
E	8
Explanation	p updates i
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633263 [created: 2013-06-21 08:41:22, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	<p>Lennox has a method:</p> <pre>void dele_root(struct node **root)</pre> <div> <pre> { free(*root); *root = NULL; } </pre> </div> <p>What is most likely to happen?</p>
A	Deletes a copy of root (will not have an effect outside the function)
B	Segfault
C	Deletes the argument given to the function (will have an effect outside the function)
D	A lot of crazy stuff will be printed
Explanation	This will free what root is pointing to; it is a presumably valid memory location and hence won't segfault or core dump.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-C, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, TopicSimon-Lifetime, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635033 [created: 2013-06-29 23:26:02, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Consider the code below; what value will i have at the end of the code?

	<pre>int *p, i; i = 3; p = &i; (*p)++; i++;</pre>
A	3
B	4
C	5
D	6
E	8
Explanation	i is incremented twice, once through p
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value									
ID	635035 [created: 2013-06-29 23:29:08, author: patitsas (xelizabeth), avg difficulty: 1.0000]									
Question	<div>Consider the code below; fill in the table below of what values p and i will have at the end of the code.</div> <div><pre>int *p, i;</pre><pre>i = 3; p = &i; (*p)++; i++;</pre></div> <div><table><tr><th>Variable name</th><th>Variable's address</th><th>Variable's value</th></tr><tr><td>p</td><td>0x0000123abc</td><td></td></tr><tr><td>i</td><td>0x567def0000</td><td>(withheld)</td></tr></table></div>	Variable name	Variable's address	Variable's value	p	0x0000123abc		i	0x567def0000	(withheld)
Variable name	Variable's address	Variable's value								
p	0x0000123abc									
i	0x567def0000	(withheld)								
A	0x567def0001									
B	5									
C	0x567def0000									
D	3									
E	0x567def0004									
Explanation	p gets i's address and the (*p)++ does not change it.									
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops									

Field	Value
ID	618653 [created: 2013-05-28 21:16:02, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>A compiler error existed in this code. Why is that happening?</p> <pre>public class test { static int testCount; public int getCount(){ return testCount; } }</pre>

	<pre> } public test(){ testCount ++; } public static void main(String [] Args){ System.out.print(getCount()); } } </pre>
A	testCount has not been initialized
B	getCount() cannot be called inside main method.
C	testCount as a static variable cannot be referenced in a non-static method such as getCount() or a constructor such as test().
D	testCount's access modifier is not public.

Field	Value
ID	635034 [created: 2013-06-29 23:27:53, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The following method, called <code>maxRow()</code>, is intended to take one parameter: a <code>List</code> where the elements are <code>List</code>s of <code>Integer</code> objects. You can think of this parameter as a matrix--a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 9 so that this method works as intended:</p> <pre> public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 } </pre>
A	<code>maxSum</code>
B	<code>row</code>
C	<code>sum</code>
D	<code>col</code>
E	<code>maxVec</code>
Explanation	<p>The local variable <code>maxVec</code> is used to keep track of the row number of the maximum row sum seen so far, as the outer loop progresses across all rows in the matrix. The inner loop computes the sum of all cells in the current row, which is stored in the local variable <code>sum</code>. If the current row's sum is larger than the maximum seen so far, the variable <code>maxVec</code> should be updated to be <code>row</code>.</p>
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	635074 [created: 2013-06-30 10:40:57, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	Consider the following classes:

```

public class A
{
    private int myNum;
    public A(int x)        { myNum = x;    }
    public int  getNumber() { return myNum; }
    public String getLetters() { return "A"; }
    public String getMessage()
    {
        return getLetters() + "-" + getNumber();
    }
}

public class AB extends A
{
    public AB(int x)        { super(x + 1); }
    public int  getNumber() { return super.getNumber() + 1; }
    public String getLetters() { return "AB"; }
}

```

What is the output of the following code segment?

```
A test = new AB(0);
```

```
System.out.print(test.getMessage());
```

A	A-0
B	A-2
C	AB-0
D	AB-1
E	AB-2
Explanation	The object created is an instance of class AB , despite the static type of the variable test . Because of the constructor defined in AB , the object's myNum field will be initialized with the value 1. Because of polymorphism, when getMessage() calls getLetters() , the definition of the method in AB will be used, returning "AB". Similarly, when getMessage() calls getNumber() , the definition of the method in AB will be used, returning 2.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, TopicSimon-OOconcepts, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632274 [created: 2013-06-18 10:33:24, author: kate (xkate), avg difficulty: 0.2500]
Question	Which data structure uses less space per object?
A	an array
B	a linked list
C	they are both the same
Explanation	In a linked list, you create a Node for each element that contains not only the element but a link to the next Node. In addition, you create a List object that contains additional fields such as a link to the first Node in the list and (often) the size of the list. In an array, you store only the elements, not a Node or a link to the next Node.
Tags	ATT-Transition-ApplyCSSpeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633890 [created: 2013-06-23 13:01:24, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Which code snippet is tail recursive?
A	<pre>int sum(int x)</pre>

	<pre> { if(x == 1) { return x; } return x + sum(x - 1); } </pre>
B	<pre> int sum(int x, int running_total) { if(x == 0) { return running_total; } return sum(x - 1, running_total + x); } </pre>
Explanation	A) requires the call to sum() to be completed before adding x to it.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-ExplainCode, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion

Field	Value
ID	633237 [created: 2013-06-12 23:23:19, author: crjrc (xchris), avg difficulty: 1.0000]
Question	When deleting a node with both left and right children from a binary search tree, it may be replaced by which of the following?
A	its left child
B	its right child
C	its preorder successor
D	its inorder successor
E	its postorder successor
Explanation	A common choice for the replacement node is deleted node's right child's leftmost descendent. This descendent is the deleted node's inorder successor.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-DesignProgramWithoutCoding, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630967 [created: 2013-06-13 12:30:59, author: kate (xkate), avg difficulty: 0.3333]
Question	<p>Suppose you are writing a program for a robot that will go around a building and clean the floor. Your program will contain, among other things, a Robot class and a Building class (with information about the layout of the building). The Building class is also used in a different program for scheduling maintenance of various parts of the building.</p> <p>The relationship between your Robot class and your Building class is best modeled as:</p>
A	a class-subclass relationship
B	a subclass-class relationship
C	a peer relationship
D	a whole-component relationship
Explanation	A and B are wrong, because a Building object doesn't share all the properties and behaviors of a Robot object (or vice versa). D is wrong because the Building object is not part of the Robot object (unlike the Robot's wheels, for example). The two classes are sometimes part of different programs and sometimes work together -- a peer relationship.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-

Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Bloom-5-Synthesis, Language-none-none-none, CS1, LinguisticComplexity-2-Medium, TopicSimon-OOconcepts, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634187 [created: 2013-06-24 14:56:59, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What is the worst-case time performance of heapsort?
A	$O(n \lg n)$
B	$O(n)$
C	$O(\lg n)$
D	$O(n^2)$
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, TopicWG-Heaps, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN

Field	Value
ID	632097 [created: 2013-06-14 23:35:32, author: tclear (xtony), avg difficulty: 0.0000]
Question	What is output from the following section of code? <pre>int i = 4; int j = i - 1; printf("%d bows = %d wows", i, j+1);</pre>
A	3 bows = 4 wows
B	4 bows = 4 wows
C	3 bows = 5 wows
D	4 bows = 5 wows
E	E 4 bows = 3 wows
Explanation	Through the printf function the decimal integer values defined by the %d field specifiers are replaced by the values for i and j resulting from the expression. The value of variable j is both decremented and incremented to remain equivalent to that of variable i when printed.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-IO, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low

Field	Value
ID	634251 [created: 2013-06-25 02:21:26, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.3333]
Question	Read the following method skeleton and choose the best expression to fill in the blank on line 4 so that the method will behave correctly: <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <pre>/** * Takes a string reference and counts the number of times * the character 'A' or 'a' appears in the string object. * @param aString String reference to object containing chars. * @precondition aString is not null (you may assume this is true). * @return The number of times 'A' or 'a' appears in the string. */ public static int countAs(String aString) // line 1 { int counter = _____; // line 2 int totalA = 0; // line 3 while (counter < _____) // line 4 { if (_____ .equals("A")) // line 5 { totalA = totalA + _____; // line 6 } counter++; // line 7 } return _____; // line 8 }</pre> </div>

	<code>}</code>
A	<code>aString.size()</code>
B	<code>aString.size() - 1</code>
C	<code>aString.length</code>
D	<code>aString.length()</code>
E	<code>aString.length() - 1</code>
Explanation	The variable <code>counter</code> is being used as an index into the string that is being examined, and from line 7 it is clear that this index is increasing on each loop iteration, moving from left to right. Because the loop test uses the <code><</code> operator, the correct upper limit is <code>aString.length()</code> . Remember that strings provide a <code>length()</code> method for obtaining their length (<code>size()</code> is used for containers like lists and maps, and <code>length</code> written as a field reference instead of a method call is used for arrays).
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	633249 [created: 2013-06-21 08:20:54, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Consider the code <pre>int i, *q, *p; p = &i; q = p; *p = 5;</pre> <p>Which of the following will print out "The value is 5."?</p>
A	<code>printf("The value is %d", &i);</code>
B	<code>printf("The value is %d", p);</code>
C	<code>printf("The value is %d", *q);</code>
D	<code>printf("The value is %d", *i);</code>
Explanation	p and q are currently "sharing" --- they both point to the same variable (i).
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633372 [created: 2013-06-19 07:32:18, author: crjrc (xchris), avg difficulty: 0.5000]
Question	What order must elements 1, 2, 3, 4, 5, 6, and 7 be inserted in a binary search tree such that the tree is perfectly balanced afterward?
A	4 1 2 3 5 6 7
B	4 2 6 1 3 5 7
C	2 1 3 4 6 5 7
D	1 2 3 4 5 6 7
E	2 1 3 6 5 7 4
Explanation	The middle element 4 will need to be the root, so that must be inserted first. The middle elements of the remaining halves must be 4's children, so 2 and 6 must be inserted next. (Their relative order does not matter.) The last four elements can be inserted in any order.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Search-Balanced, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634925 [created: 2013-06-27 08:07:32, author: mikeyg (xmikey), avg difficulty: 0.5000]
Question	<p>Which algorithm does the following code implement?</p> <pre>def mystery(target, listOfValues): beginning = 0 end = len(listOfValues) found = False while (! found and (beginning <= end)): middle = (beginning + end) / 2 if (listOfValues[middle] == target): found = True print "Found it at location: ", middle else: if (target < listOfValues[middle]): end = middle - 1 else: beginning = middle + 1 if (! found): print "Item not found"</pre>
A	Short Sequential Search
B	Sequential Search
C	Binary Search
D	Bubble Search
E	None of the above.
Explanation	This a classic implementation of binary search.
Tags	Nested-Block-Depth-3-three-nested, Contributor_Michael_Goldweber, ATT-Transition-Code_to_English, SkillWG-AnalyzeCode, ATT-Type-Why, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-Python, CSI, LinguisticComplexity-1-Low, TopicWG-Searching-Binary, CodeLength-lines-06-to-24_Medium

Field	Value
ID	633310 [created: 2013-06-18 08:19:44, author: crjirc (xchris), avg difficulty: 0.5000]
Question	What abstract data type is best suited to help us implement a breadth-first search?
A	priority queue
B	queue
C	stack
D	hashtable
E	array-based list
Explanation	In a breadth-first search, we visit the starting element, its neighbors, its neighbors' neighbors, and so on. We want to make sure we visit the neighbors of the elements we saw earliest before we visit the neighbors of elements we saw later. This suggests a first-in, first out approach.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-Graphs, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633220 [created: 2013-06-12 05:56:57, author: crjirc (xchris), avg difficulty: 0.5000]
Question	This sorting algorithm repeatedly examines neighboring elements, swapping those pairs that are out of order.
A	selection sort
B	insertion sort

C	bubble sort
D	quick sort
E	merge sort
Explanation	Bubble sort operates by reordering neighbors.
Tags	Contributor_Chris_Johnson, ATT-Transition-English_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632313 [created: 2013-06-18 12:39:37, author: kate (xkate), avg difficulty: 0.0000]
Question	The enqueue operation:
A	adds a new item at the front of the queue
B	returns without removing the item at the front of the queue
C	removes and returns the item at the front of the queue
D	adds a new item at the end of the queue
E	returns true if the queue is empty and otherwise false
Explanation	enqueue is the name for the operation that adds an element to a queue. Specifically, it adds each item to the end of the queue (just like standing in line).
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, TopicWG-ADT-Queue-DefinterfaceUse, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-0-WWWWWW, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633897 [created: 2013-06-23 13:15:18, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	If Matthew is entering the values 1, 2, 3, 4, 5 into a complete tree, where insertion happens in level-order, in what order should he enter the values so he produces a binary search tree?
A	1, 2, 3, 4, 5
B	4, 2, 5, 1, 3
C	3, 1, 5, 2, 4
D	1, 3, 2, 5, 4
Explanation	Only B will produce a complete BST.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Bloom-4-Application, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicWG-Trees-Search-Balanced, TopicWG-Trees-Search-NotBalanced

Field	Value
ID	630974 [created: 2013-06-13 12:41:28, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.5000]
Question	Consider the following code: <div> <pre> if (!somethingIsTrue()) { return true; } else { return false; } </pre> </div>

	Which replacement for this code will produce the same result?
A	<code>return true;</code>
B	<code>return false;</code>
C	<code>return somethingIsTrue();</code>
D	<code>return !somethingIsTrue();</code>
E	none of these
Explanation	The method <code>somethingIsTrue()</code> must return a boolean value, because of the way it is used in the if statement's condition. If it returns the value <code>false</code> , the if statement will cause the value <code>true</code> to be returned; otherwise, the if statement will cause the value <code>false</code> to be returned. Therefore, the entire if statement is equivalent to <code>return !somethingIsTrue();</code> .
Tags	Nested-Block-Depth-1, ATT-Transition-ApplyCode, Skill-ExplainCode, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	633296 [created: 2013-06-18 07:57:13, author: crjrc (xchris), avg difficulty: 0.5000]
Question	You are storing a complete binary tree in an array, with the root at index 0. At what index is node i's right child?
A	2i
B	2i + 1
C	i + i + 2
D	i / 2 + 1
E	(i - 1) / 2
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-CollectionsExceptArray, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633572 [created: 2013-06-19 15:33:59, author: crjrc (xchris), avg difficulty: 0.5000]
Question	You've got a <code>byte</code> variable holding the value 127. You add 1 with <code>byte += 1</code> . What happens?
A	It becomes a short with value 128.
B	An OverflowException is raised.
C	It remains a byte and stays at the value 127.
D	It remains a byte and takes on the value -128.
E	It remains a byte and takes on the value 0.
Explanation	When you exceed the maximum value of an integral type, you wrap around to other extreme. Bytes range from -128 to 127.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634186 [created: 2013-06-24 14:55:15, author: patitsas (xelizabeth), avg difficulty: 1.5000]
Question	What is the size of the largest min-heap which is also a BST?
A	2
B	1

C	4
D	3
Explanation	You cannot add a left child to the root because it would break the BST/min-heap property.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-3-High, ExternalDomainReferences-1-Low, TopicWG-Heaps, Bloom-5-Synthesis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Trees-Other, TopicWG-Trees-Search-NotBalanced

Field	Value
ID	634968 [created: 2013-06-19 13:01:34, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	Which of the following is true about both interfaces and abstract classes?
A	They do not have constructors
B	All of their methods are abstract
C	They can have both abstract and non-abstract methods
D	They can be used to model shared capabilities of unrelated classes
E	None of the above
Explanation	Abstract methods have constructors, interfaces do not An anstract class can include both abstract and non-abstract methods, while all methods in interfaces are abstract An abstract class can model shared capabilities of classes, but only those who share the abstract class as an ancestor (so related), whereas there is no such restriction on interfaces.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Language-Java, CS1, TopicSimon-MethodsFuncsProcs, CS2, CodeLength-NotApplicable, TopicSimon-ProgramDesign

Field	Value
ID	634940 [created: 2013-06-24 11:26:33, author: patitsas (xelizabeth), avg difficulty: 2.0000]
Question	Jacob has written some code using our standard linked list node definition (it has an <code>int val</code> and a <code>struct node *next</code> , in that order): <pre>struct node *my_node = malloc(sizeof(struct node));</pre> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>my_node->val = 4; my_node->next = NULL; struct node **ptr_node = &my_node; *(*ptr_node)++;</pre> </div> <p>If the value of <code>my_node</code> is initially 0x50085008, what will the value of <code>my_node</code> most likely be after this code?</p>
A	0x50085008
B	0x50085010
C	0x5008500C
D	0x50085018
Explanation	You would it expect it to be 0x50085014 (0x50085008 + size of int + size of pointer), but C actually does address padding, pushing it up to 0x50085018, which is wha you would see if you run the code.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-3-High, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633552 [created: 2013-06-19 08:25:29, author: crjjrc (xchris), avg difficulty: 0.5000]

Question	A coworker suggests that when you delete a node from a hashtable that you just set it to null. What is your response?
A	Yes, that way the garbage collector can reclaim the memory.
B	Yes, that will speed up probing.
C	No, the user may have alias references to the node.
D	No, doing so may make other nodes irretrievable.
Explanation	When using probing to resolve collisions, the probing algorithm walks along the probing sequence until it finds a null element. If nulls appear in the wrong places, probing may terminate earlier than it should.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Block-Vertical-4-Macro-Structure, Bloom-6-Evaluation, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634431 [created: 2013-06-18 09:46:22, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you are trying to choose between an array and a singly linked list to store the data in your program. Which data structure must be traversed one element at a time to reach a particular point?
A	an array
B	a linked list
C	both
D	neither
Explanation	In a basic linked list, each element is connected to the one after it. To reach a given element, you must start with the first node, if it's not the one you want, follow the link to the next one, and so forth until you reach the end of the list. (These are called "singly linked lists"; it is also possible to construct a doubly linked list, where each node is connected to the previous *and* the next element.)
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634945 [created: 2013-06-29 21:41:50, author: patitsas (xelizabeth), avg difficulty: 0.6667]
Question	<p>Richard has the following struct:</p> <pre>struct node{</pre> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre> int val; struct node *next; };</pre> </div> <p>And he creates a node:</p> <pre>struct node **ptr = &(amp; malloc(sizeof(struct node))));</pre> <p>Which of the following will NOT set ptr's associated val to 6?</p>
A	(**ptr).val = 6
B	(**ptr).val = 6
C	(*ptr)->val = 6
Explanation	***ptr is not useful here
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, CS2, LinguisticComplexity-2-Medium, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	627766 [created: 2013-06-07 09:15:48, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Consider the following recursive method:</p> <pre>public int examMethod(int n) { if (n == 1) return 1; else return (n + this.examMethod(n-1)); }</pre> <p>What value is returned by the call <code>examMethod(16)</code>?</p>
A	1
B	16
C	136
D	None of the above.
Explanation	This method returns the sum of the numbers from 1 to the parameter n (as long as n is greater than or equal to 1).
Tags	Nested-Block-Depth-1, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	632575 [created: 2013-06-19 14:26:05, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you place m items in a hash table with an array size of s. What is the correct formula for the load factor?
A	s + m
B	s – m
C	m – s
D	s/m
E	m/s
Explanation	The load factor is the number of elements in the array, divided by the size of the array. It gives you an idea of how full the hashtable is.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634916 [created: 2013-06-29 21:09:25, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.5000]
Question	<p>The Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13 ... Any term (value) of the sequence that follows the first two terms (0 and 1) is equal to the sum of the preceding two terms. Consider the following incomplete method to compute any term of the Fibonacci sequence:</p> <pre>public static int fibonacci(int term) { int fib1 = 0; // Line 1 int fib2 = 1; // Line 2 int fibn = 0; // Line 3 if (term == 1) // Line 4 { return fib1; // Line 5 } if (term == 2) // Line 6 { return fib2; // Line 7 } }</pre>

```

    for (-----)      // Line 8: loop to the nth term
    {
        fibn = -----; // Line 9: compute the next term
        fib1 = -----; // Line 10: reset the second preceding term
        fib2 = -----; // Line 11: reset the immediate preceding term
    }
    return fibn;        // Line 12: return the computed term
}

```

Choose the best answer to fill in the blank on line 8.

A

B

C

D

E

Explanation From the question, it is clear that the terms in the sequence are numbered starting at 1. The two base cases cover terms 1 and 2, and the loop must then repeat (term - 2) times in total. This will be achieved if the initial value on the loop counter is 1.

Tags ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	633661 [created: 2013-06-22 10:31:58, author: jspacco (xjaime), avg difficulty: 0.6667]
Question	Which of these relationships best exemplify the "IS-A" relationships in object-oriented programming (OOP)?
A	Empire State Building IS-A Building
B	Cat IS-A Mammal
C	Angry Cat IS-A Cat (Note that "Angry Cat" is a specific cat that has become an online internet meme)
D	All of the above
E	None of the above
Explanation	A and C are wrong because the Empire State Building would be best be described as an instance of the category Building, while Angry Cat is an instance of the category Cat. B is correct because Cat is a sub-category of Mammal, which best exemplifies the IS-A relations. In OOP, the IS-A relationship is used to denote relationships between classes, which are sort of like categories.
Tags	Contributor_Jaime_Spacco, ATT-Transition-English_to_CSspeak, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632850 [created: 2013-06-20 11:13:17, author: jspacco (xjaime), avg difficulty: 0.5000]
Question	What does this print when x is assigned 1? <pre> if (x==1) { System.out.println("x is 1"); } if (x==2) { System.out.println("x is 2"); } else { System.out.println("not 1 or 2"); } </pre>
A	x is 1
B	x is 2
C	x is 1

	x is 2
D	x is 1 not 1 or 2
E	x is 2 not 1 or 2
Explanation	<p>This code snippet does not have an else-if! It may as well be written like this:</p> <pre> if (x==1) { System.out.println("x is 1"); } if (x==2) { System.out.println("x is 2"); } else { System.out.println("not 1 or 2"); } </pre> <p>So when x==1, clearly we get "x is 1" printed, but since 1 does not equal 2, we also get "not 1 or 2" with the else.</p> <p>Be aware of when you are using an if, and when you are using an else-if, because they are quite different!</p>
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	634127 [created: 2013-06-23 13:04:28, author: patitsas (xelizabeth), avg difficulty: 0.5000]
Question	In C, which of the following will return 1, if s1 = "hi" and s2 = "hi"? Circle all that apply.
A	s1 == s2
B	strcmp(s1, s2)
C	strlen(s1)
D	s1 == "hi"
Explanation	C is not Python! Only strcmp will do what Python and similar languages would do. (My CS2 students come into C having learnt Python.)
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-RelationalOperators, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633291 [created: 2013-06-18 07:47:41, author: crjirc (xchris), avg difficulty: 0.0000]
Question	Inserting a node into a heap is
A	O(1)
B	O(log N)
C	O(N)
D	O(N log N)
E	O(N ²)
Explanation	Inserting a node involves putting the new node into the bottom level of the heap and trickling up, possibly to the root level. Since heaps are balanced and the number of levels is log N, the performance is O(log N).
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicWG-Heaps, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630996 [created: 2013-06-13 13:02:52, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java method:</p> <pre> public void printMenu(){ System.out.println("Choose one of the following options:"); System.out.println("1) Display account balance"); System.out.println("2) Make deposit"); System.out.println("3) Make withdrawal"); System.out.println("4) Quit"); } </pre> <p>Select the best reason for making this a separate method with a name, instead of including the code in some other method:</p>
A	Otherwise, you would have to write the same code more than once.
B	By breaking your program up into logical parts, you make it more readable.
C	By giving this block of code a name, you make your program more readable.
D	It's necessary to keep the calling method under 20 lines long.
Explanation	There are multiple correct answers to this question. A, B, and C are all reasonable answers. D is less good, because while it's a good idea to keep your methods relatively short, it won't always make sense to stick to an arbitrary limit like 20 lines.
Tags	ATT-Transition-CSspeak_to_Code, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-5-Synthesis, LinguisticComplexity-1-Low, CS1, TopicSimon-MethodsFuncsProcs, MultipleAnswers-See-Explanation, TopicSimon-ProgramDesign, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635037 [created: 2013-06-29 23:31:20, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	A given $O(n^2)$ algorithm takes five seconds to execute on a data set size of 100. Using the same computer and the same algorithm, how many seconds should this algorithm run for when executed on a data set of size 500?
A	25 seconds
B	100 seconds
C	42 seconds
D	125 seconds
E	None of the above.
Explanation	Quadratic algorithms represent an n^2 increase in run time. Hence if the data set size increases by a factor of five, for a quadratic algorithm, the increase in run time becomes a factor of 25. Hence 25 times 5 (base run time) is 125.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632280 [created: 2013-06-18 10:54:37, author: kate (xkate), avg difficulty: 0.0000]
Question	If the StackADT operation push is implemented using a linked list, the big-Oh time complexity of the method is:
A	$O(1)$
B	$O(\log_2 n)$
C	$O(n)$
D	$O(n^2)$

E	$O(2^n)$
Explanation	The push method adds a new element to a stack. Regardless of the size of the list, the operations needed to add a new element include creating a node to store it in and setting the values of a few pointers, all of which can be done in constant time.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618622 [created: 2013-05-28 21:01:01, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which line of the following code has a compilation error?</p> <pre>import java.util.*; public class bicycles { public static void main(String[] Main) { Vector<bike> q = new Vector(); bike b = new bike(); q.add(b); } } class bike{ private int bikePrice; private bike(){ bikePrice = 0; } private bike(int p){ bikePrice = p; } }</pre>
A	public static void main(String[] Main)
B	Vector<bike> q = new Vector();
C	bike b = new bike();
D	private int bikePrice;

Field	Value
ID	632844 [created: 2013-06-20 10:58:54, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignments <code>a = True</code> and <code>b = True</code> , what is returned by <code>(not a or b) and (a or not b)</code> ?
A	True
B	False
C	1
D	0
E	an error
Explanation	<p>the not operator has a higher precedence than or, so this expression should be read:</p> <p><code>((not a) or b) and (a or (not b))</code></p> <p>Which is True when a=True and b=False</p>

Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, Language-Python, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	633457 [created: 2013-06-21 17:24:32, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following code:</p> <pre> number = int(input("Enter a positive number: ")) while number > 1: if (number % 2 == 1): number = number * 3 + 1 else: number = number/2 print number if number == 1: break else: print "The end" </pre> <p>What output is produced when the input is '-1'?</p>
A	an error
B	The end
C	no output is produced
D	-1
E	none of the above
Explanation	if number is not greater than 1, we immediately get to "The end". In Python, while loops are allowed to have an else statement.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	627736 [created: 2013-06-07 07:42:13, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>3. Consider the following class definition.</p> <pre> import java.util.Scanner; public class SillyClass2 { private int num, totalRed, totalBlack; public SillyClass2 () { num = 0; totalRed = 0; totalBlack = 0; this.spinWheel(); System.out.print("Black: " + totalBlack); System.out.println(" and red: " + totalRed); } public void spinWheel () { Scanner kbd = new Scanner(System.in); System.out.println("Enter 1 or 0, -1 to quit."); num = kbd.nextInt(); while (num >= 0) { if (num == 0) totalRed++; else if (num == 1) totalBlack++; else System.out.println("Try again"); System.out.println("Enter 1 or 0, -1 to quit."); num = kbd.nextInt(); } } } </pre>

	<pre> System.out.println("Thanks for playing."); } }</pre>
	Which of the following sequences of inputs causes every line of code to be executed at least once?
A	0 0 10 -1
B	1 0 1 -1
C	1 1 10 -1
D	1 0 10 -1
E	1 0 10 0
Explanation	This question tests understanding of a conditional nested inside a loop. Choice A is wrong, because the initial value must be ≥ 0 for the loop to be executed. Choice E is wrong, because the last value must be -1, or the code never exits the loop and the last line of code is not executed. Choices B and C are wrong, because inside the loop, we need one value that's 0, one value that's 1, and one value that's greater than 1, so that each branch of the conditional will be executed.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-25-or-more_High, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Testing

Field	Value
ID	632308 [created: 2013-06-18 12:24:34, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Suppose <code>StackADT</code> is implemented in Java using a linked list. The big-Oh time complexity of the following <code>peek</code> method is:</p> <pre> public T peek() { T tmp; if (this.top == null) { tmp = null; } else { tmp = this.top.getElement(); } return tmp; }</pre>
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n^2)$
E	$O(2^n)$
Explanation	The method body is executed in a fixed amount of time, independent of the size of the stack.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicWG-ADT-Stack-Implementations, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	633569 [created: 2013-06-19 14:41:21, author: crjjrc (xchris), avg difficulty: 2.0000]
Question	You need to store a large amount of data, but you don't know the exact number of elements. The elements must be searched quickly by some key. You want to waste no storage space. The elements to be added are in sorted order. What is the simplest data structure that meets your needs?
A	Ordered array
B	Linked list
C	Hashtable
D	Binary search tree

E	Self-balancing tree
Explanation	Hashtables provide fast searching, but they may waste storage space. A tree makes better use of memory. Since the keys are in a sorted order, it's likely a binary tree will end up looking like a linked list instead of a well-balanced tree. With a self-balancing tree, we can make sure searching goes faster.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633225 [created: 2013-06-12 07:09:07, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Which one of the following is a limitation of Java's arrays?
A	They can only hold primitive types.
B	They can only hold reference types.
C	Once an element is assigned, that element cannot be modified.
D	Their length must be stored separately.
E	They cannot change size.
Explanation	Arrays hold primitives and references, have a builtin length property, and allow modification of individual elements. They cannot be resized.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicWG-ChoosingAppropriateDS, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618500 [created: 2013-05-28 19:52:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What will be printed? String name = "John"; String surname = "Smith"; name.concat(surname); System.out.print(name + " "); System.out.println(surname);
A	John Smith
B	John Smith Smith
C	JohnSmith Smith
D	Smith John

Field	Value
ID	618498 [created: 2013-05-28 19:51:31, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What should be done to change the following code to a correct one? <pre>public class exam { float mark; public static void main(String[]arg){ float aCopyofMark; exam e = new exam(); System.out.println(e.mark + aCopyofMark); } }</pre>

A	Change float mark; to static float mark;
B	Delete exam e = new exam();
C	Initialize aCopyofMark
D	This is a correct code.

Field	Value
ID	633646 [created: 2013-06-22 09:38:24, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	<p>Consider the following two simple Java classes:</p> <pre> public class Base { protected int x; } public class Derived extends Base { protected int y; } </pre> <p>Which of the following is/are legal?</p>
A	Base b=new Base(); Derived d=b;
B	Derived d=new Derived(); Base b=d;
C	Base b=new Derived();
D	Derived d=new Base();
E	All of the above
Explanation	<p>B and C are OK. Remember your Liskov substitution principle: You can swap in a derived class anywhere that you expect a base class, because a derived class has at least as much information as a base class.</p> <p>The reverse, however, is not true! A derived class may add many more instance variables that the base class knows nothing about!</p>
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, MultipleAnswers-See-Explanation, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632761 [created: 2013-06-19 20:58:09, author: ray (ray), avg difficulty: 1.0000]
Question	<p>This question refers to a method "swap", for which part of the code is shown below:</p> <pre> public static void swap(int[] x, int i, int j) { // swaps elements "i" and "j" of array "x". int temp; // temporary storage for swapping xxx missing code goes here xxx } // method swap </pre> <p>The missing code from "swap" is:</p>
A	<pre> temp = x[i]; x[i] = x[j]; x[j] = temp; </pre>
B	

	<pre>temp = x[i]; x[j] = x[i]; x[i] = temp;</pre>
C	<pre>temp = x[j]; x[j] = x[i]; x[i] = temp;</pre>
D	<pre>temp = x[j]; x[i] = x[j]; x[j] = temp;</pre>
E	<pre>temp = x[i]; x[j] = x[i]; x[i] = temp;</pre>
Explanation	<p>Suppose initially $x[i]=A$, $x[j]=B$. After swap, we want $x[i]=B$, and $x[j]=A$, in both cases it doesn't matter what temp equals, so long as $x[i]$ and $x[j]$ values have been swapped after completion.</p> <p>a)</p> <pre>temp = x[i] = A x[i] = x[j] = B x[j] = temp = A</pre> <p>Before: $x[i] = A$, $x[j] = B$ After: $x[i] = B$, $x[j] = A$ Both have been swapped, ∴ CORRECT</p> <p>b)</p> <pre>temp = x[i] = A x[j] = x[i] = A x[j] = temp = A</pre> <p>Before: $x[i] = A$, $x[j] = B$ After: $x[i] = A$, $x[j] = A$ Only $x[j]$ has been swapped, ∴ INCORRECT</p> <p>c)</p> <pre>temp = x[j] = B x[j] = x[i] = A x[j] = temp = B</pre> <p>Before: $x[i] = A$, $x[j] = B$ After: $x[i] = A$, $x[j] = B$ Neither have been swapped, ∴ INCORRECT</p> <p>d)</p> <pre>temp = x[j] = B x[i] = x[j] = B x[j] = temp = B</pre> <p>Before $x[i] = A$, $x[j] = B$ After: $x[i] = B$, $x[j] = B$ Only $x[i]$ has been swapped, ∴ INCORRECT</p> <p>e)</p> <pre>temp = x[i] = A x[j] = x[i] = A x[i] = temp = A</pre> <p>Before: $x[i] = A$, $x[j] = B$</p>

	After: x[i] = A, x[j] = A
	Only x[j] has been swapped, ∴ INCORRECT
Tags	Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicSimon-Assignment, Block-Vertical-2-Block, Language-Java, Bloom-4-Application, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618483 [created: 2013-05-28 19:41:09, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	Class B extends class A in which a method called firstMethod existed. The signature of firstMethod is as follow. In class B we are going to override firstMethod. Which declaration of this method in class B is correct? protected void firstMethod(int firstVar)
A	private void firstMethod(int firstVar)
B	default void firstMethod(int firstVar)
C	public void firstMethod(int firstVar)
D	void firstMethod(int firstVar)

Field	Value
ID	633579 [created: 2013-06-19 15:03:38, author: crjrc (xchris), avg difficulty: 2.0000]
Question	<p>You've got a class that holds two ints and that can be compared with other IntPair objects:</p> <pre> class IntPair { private int a; private int b; public IntPair(int a, int b) { this.a = a; this.b = b; } public int compareTo(IntPair other) { if (a < other.a) { return -1; } else if (a > other.a) { return 1; } else { if (b == other.b) { return 0; } else if (b > other.b) { return -1; } else { return 1; } } } } </pre> <p>Let's denote new IntPair(5, 7) as [5 7]. You've got a list of IntPairs: [5 7], [2 9], [3 2]</p> <p>You sort them using IntPair.compareTo. What is their sorted order?</p>
A	[2 9], [3 2], [5 7]
B	[5 7], [3 2], [2 9]
C	[3 2], [5 7], [2 9]
D	[2 9], [5 7], [3 2]

Explanation	compareTo orders on IntPair.a first, in ascending fashion. Since all elements have unique a values, we simple sort according to the first element.
Tags	Contributor_Chris_Johnson, Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-NotApplicable, TopicWG-Searching, TopicSimon-RelationalOperators, TopicWG-Sorting-Other, ConceptualComplexity-2-Medium

Field	Value
ID	633598 [created: 2013-06-22 02:38:41, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int inner=0; int outer=0; for (int i=0; i<6; i++) { outer++; for (int j=0; j<=3; j++) { inner++; } } System.out.println("outer "+outer+", inner"+inner); </pre>
A	outer 6, inner 3
B	outer 7, inner 4
C	outer 6, inner 18
D	outer 7, inner 24
E	outer 6, inner 24
Explanation	For nested loops, the inner loop runs to completion one time for each iteration of the outer loop. So if the outer loop executes 6 times, that means the inner loop, which normally executes its loop body 4 times, will actually run the loop body 24 times (4 executes times 6 outer executions). I probably could explain that better.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632790 [created: 2013-06-20 08:14:12, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignments <code>x = 27</code> and <code>y = 12</code> , what is returned by <code>x/y</code> ? (Assume Python <= 2.7, not Python3).
A	2
B	2.25
C	3
D	3.0
E	None of the above
Explanation	This is an integer division question. Python will return 2, since 27/12 is 2, with a remainder. But integer division only cares about the quotient, not the remainder. Note that you may get a different answer using Python3 rather than with Python2.x
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, TopicWG-Numeric-Int-Truncation, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632599 [created: 2013-06-19 15:27:00, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following is not an ADT?
A	List

B	Queue
C	Hashtable
D	Stack
Explanation	Hashtable is a data structure, not an abstract datatype. Note: this question is based on a question by Andrew Luxton-Reilly.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618516 [created: 2013-05-28 20:00:53, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What kind of variable is <i>label</i> ? <pre>public class Labeller extends JFrame { public Labeller () { JLabel label = new JLabel("Field or Variable"); } public static void main (String[] args) { new Labeller(); } }</pre>
A	local variable, primitive
B	Instance variable, primitive
C	local variable, Object Reference
D	Instance variable, Object Reference

Field	Value
ID	618485 [created: 2013-05-28 19:42:33, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	A method called myMethod has been defined in a class with the following signature. Which of these four choices cannot be an overloaded alternative for myMethod? <pre>public void myMethod (int i, double d)</pre>
A	<pre>public int myMethod (int i, double d)</pre>
B	<pre>public void myMethod (double d)</pre>
C	<pre>public void myMethod (String i, double d)</pre>
D	<pre>public int myMethod (int i)</pre>

Field	Value
ID	634921 [created: 2013-06-29 21:37:09, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	In quicksort, what does partitioning refer to?
A	How the list/array always has three partitions: the area before low, the area between low and high, and the area after high.
B	The process in which the memory allocated for the list/array that you are sorting is partitioned into different parts of memory, to improve memory efficiency.
C	The process in which the list/array is partitioned into two equal halves; the sort proceeds by recursively partitioning until we have partitions of size 2, in which case elements are

	merged in correct order.
D	The step where all elements less than a given <i>pivot</i> are placed on the left of the pivot, and all elements larger than the pivot are moved to the right.
Explanation	D is how it works.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Other, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
ID	632831 [created: 2013-06-11 07:07:09, author: crjrc (xchris), avg difficulty: 1.0000]
Question	<p>Many languages allow negative indexing for arrays: items[-1] for the last item, items[-2] for the second to last, and so on. Java doesn't support this indexing directly, but we can create a class that wraps around an array and converts a negative index into the appropriate positive one:</p> <pre>class WrappedStringArray { private String[] items; ... public String get(int i) { if (i >= 0) { return items[i]; } else { return TODO; } } }</pre> <p>What expression must we replace TODO with to support negative indexing?</p>
A	(int) Math.abs(i)
B	items.length + i
C	(int) Math.abs(i + 1)
D	items.length - 1 - i
E	items.length - i
Explanation	We want items[-1] to map to items[items.length - 1], and only the correct answer handles this case.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCode, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

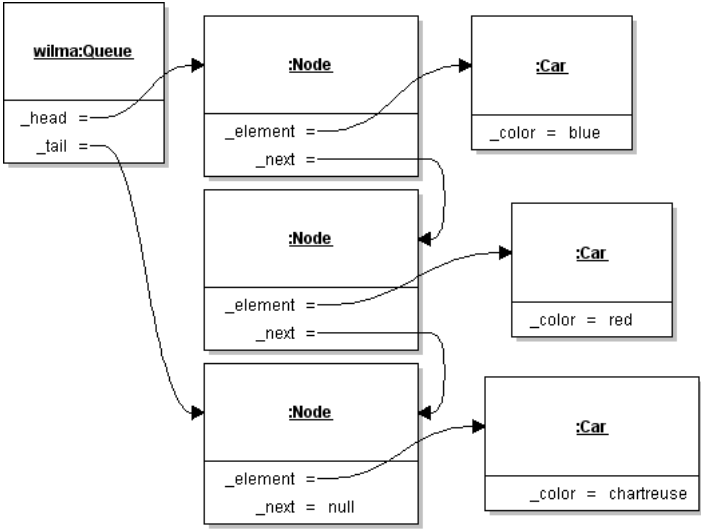
Field	Value
ID	633558 [created: 2013-06-19 11:21:35, author: crjrc (xchris), avg difficulty: 2.0000]
Question	What happens if you forget to define the <code>equals</code> method for your key class used to insert elements into a hashtable?
A	The elements can be inserted but remain inaccessible.
B	Inserting an element will raise an exception.
C	Elements can be inserted and retrieved only by using the same key instances used to insert the elements.
D	All elements will map to the same location in the table.
Explanation	When a key lookup is performed, we will find the hashtable location and then compare the keys using Object.equals. Object.equals returns true only when the two keys refer to the same object.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633559 [created: 2013-06-19 11:28:43, author: crjirc (xchris), avg difficulty: 2.0000]
Question	You've got two classes, Key and Value, both of which descend from Object. You intend to use these classes to populate a hashtable. Which class needs the hashCode method and which needs the equals method?
A	Key.hashCode, Value.equals
B	Key.hashCode, Key.equals
C	Value.hashCode, Object.equals
D	Key.hashCode, Object.equals
E	Value.hashCode, Value.equals
Explanation	Only the Key needs these methods. On a search, only the Key will be provided, so that alone must provide the necessary information for finding the corresponding Value. Object's implementation of the equals method is too restrictive, comparing Keys only for identity.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618547 [created: 2013-05-28 20:23:21, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	If you are about to evaluate the following code, which following comments would you choose? <pre> FileReader inputStream = null; try { inputStream = new FileReader("in.txt"); int c; while ((c = inputStream.read()) != -1) // ... code has been deleted }catch (IOException e){ System.out.println(e.getLocalizedMessage()); } </pre>
A	Add <i>finally</i> to the above structure.
B	Make sure you close in.txt.
C	Buffering input streams is a must.
D	All of the above choices must be applied.

Field	Value
ID	633563 [created: 2013-06-19 13:36:45, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Double hashing
A	involves hashing the hash code
B	avoids collisions by computing a hash code that's a <code>double</code> instead of an <code>int</code>
C	prevents collisions by keeping two tables
D	produces a second index in [0, table.length)
E	is less vulnerable to clustering than linear or quadratic probing
Explanation	With double hashing, a second hash function is used to determine the step size for the probing sequence. With linear or quadratic probing, elements that collide also tend to have the same step size, which leads to clustering. A secondary hash breaks up this uniformity.

Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	632544 [created: 2013-06-19 12:21:08, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	 <p>The above instance (or Object) diagram represents a <code>Queue</code>. If I invoke <code>wilma.dequeue()</code>, it returns:</p>
A	A blue car
B	A red car
C	A chartreuse car
D	A Node whose <code>_element</code> is a blue car
E	A Node whose <code>_element</code> is a chartreuse car
Explanation	Dequeue removes the least-recently enqueued element from the Queue and returns it. This element is at the "head" end of the Queue. What it returns is specified by the interface, which is independent of implementation, so it is a Car, not a Node.
Tags	Contributor_Robert_McCartney

Field	Value
ID	632545 [created: 2013-06-19 12:22:52, author: kate (xkate), avg difficulty: 0.0000]
Question	The time complexity of selection sort is:
A	$O(1)$
B	$O(n)$
C	$O(n \log n)$
D	$O(n^2)$
E	none of the above
Explanation	Selection sort requires $n(n-1)/2$ comparisons.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634914 [created: 2013-06-29 21:24:18, author: patitsas (xelizabeth), avg difficulty: 0.0000]

Question	Martina has created an array, arr[50], and she has written the following line of code: *(arr + 20) = 6; Rewrite this line to use the [] notation for arrays.
A	arr[21] = 6
B	*arr[20] = 6
C	arr[20] = 6
D	*arr[21] = 6
Explanation	arr[20] == *(arr + 20)
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-0-WWWWWW, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632795 [created: 2013-06-20 08:33:13, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	Which statement or statements store 0.8 into the variable <code>d</code> of type <code>double</code> ?
A	<code>double d=8/10;</code>
B	<code>double d=8.0/10.0;</code>
C	<code>double d=8/10.0;</code>
D	<code>double d=8.0/10;</code>
E	None of the above
Explanation	A is wrong because 8/10 is zero. But the B,C,D (8.0/10.0, 8/10.0, 8.0/10) all produce 0.8 because Java will promote any ints to a double in an arithmetic expression so long as there is at least one double in the expression.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, MultipleAnswers-See-Explanation, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	629956 [created: 2013-06-11 10:41:09, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you have a Java array of ints. The worst-case time complexity of printing out the elements in the list is:
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n \log n)$
E	$O(n^2)$
Explanation	If we assume that printing a single value can be done in constant time for some constant k, then printing n values can be done in kn time, which is $O(n)$.
Tags	Contributor_Kate_Sanders, Skill-AAA-XXXXXXXXXXXXXXXXXXXXXXXXXX, ATT-Transition-DefineCSspeak, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-0-XXXXXXXXXX, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium

Field	Value
ID	633242 [created: 2013-06-12 23:57:32, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Suppose you have a binary search tree with no left children. Duplicate keys are not allowed. Which of the following explains how this tree may have ended up this way?

A	It was filled in ascending order.
B	The root value was the maximum.
C	All keys were identical.
D	The tree is a preorder tree.
E	It was filled in descending order.
Explanation	If the least node was inserted first, with each successive node having a greater key than its predecessor, we'd end up with all right children. Adding nodes with identical keys is prohibited by the problem statement, though it would yield a similar tree.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-Why, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633277 [created: 2013-06-21 09:04:05, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Mohamed has a brute force solution for vertex covering that takes one milisecond to test a possible vertex covering. The large graph has 64 nodes, so there are 264 possibilities (approx 1.85×10^{19}). (There are 1000 ms in a second.) How long will Mohamed's code take to run?
A	about 500,000 days
B	about 500,000 years
C	about 500,000,000 years
Explanation	$((1 / 1000 * 60 * 24) \text{ day}) * 1.85 * 10^{19} = \text{about } 2 * 10^{11} \text{ days} -- \text{so not A.}$ $2 * 10^{11} \text{ days is about } 5 * 10^8 \text{ years.}$
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-2-Medium, Bloom-4-Application, Language-none-none-none, CS2, CodeLength-NotApplicable, CodeLength-lines-00-to-06_Low

Field	Value
ID	631936 [created: 2013-06-17 11:52:22, author: kate (xkate), avg difficulty: 1.0000]
Question	After the Java assignment statement <pre>String word = "blank";</pre> which of the following Java code fragments prints <pre>blink</pre> ?
A	<pre>word[2] = "i"; System.out.println(word);</pre>
B	<pre>word.replaceAll("a", "i"); System.out.println(word);</pre>
C	<pre>word = word.substring(0,1) + "i" + word.substring(3,5); System.out.println(word);</pre>
D	All of (a)–(c).
E	None of (a)–(c) .
Explanation	(a) is wrong because the Java syntax word[n] requires the variable word to be an array. (c) is almost right; it just needs to have a 2 instead of the 1 in the first call to substring. Since (a) and (c) are wrong, (d) must be wrong. (b) is correct, so (e) must be wrong.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-5-Synthesis, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CSOther, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	632020 [created: 2013-06-17 17:04:53, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following possible Java class names:</p> <p><code>General, colonel, Private, Major-General, Strategy&Tactics</code></p> <p>When determining which names are valid, which of the following factors is important:</p>
A	Class names start with a capital letter.
B	Class names must not be a Java reserved word.
C	Class names are generally nouns, corresponding to a person, place, thing, or idea.
D	Class names must start with a letter or underscore, followed by zero or more letters, digits, and/or underscores.
E	All of the above.
Explanation	Choices (b) and (d) are Java syntactic rules; A and C are generally accepted conventions.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631018 [created: 2013-06-13 14:00:06, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>In Java, what value will the variable <code>d</code> have after this declaration:</p> <p><code>double d = 18 / 4;</code></p>
A	<code>4.0</code>
B	<code>4.5</code>
C	<code>18.4</code>
D	None of these
Explanation	While the variable <code>d</code> is being declared as a <code>double</code> , the initial value provided on the righthand side is actually an <code>int</code> expression, consisting of one integer value divided by another. When the <code>int</code> expression is evaluated, its result is also an <code>int</code> and any fractional part is truncated. The value of <code>18 / 4</code> is <code>4</code> (an <code>int</code>). After this <code>int</code> value is produced, it is then promoted to a <code>double</code> value when initializing the variable <code>d</code> , giving <code>d</code> the initial value <code>4.0</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633236 [created: 2013-06-12 23:18:09, author: crjirc (xchris), avg difficulty: 1.0000]
Question	<p>This code fails to compile:</p> <pre>char current = 'a'; current = current + 1;</pre> <p>Why?</p>
A	We can't add ints and chars.
B	We're trying to squeeze an int into a char.
C	The character after 'a' is platform-dependent.
D	We're trying to squeeze a String into a char.
E	The assignment is infinitely recursive.
Explanation	The char is promoted to an int when an int is added to it. Thus, our right-hand side is an int while our left-hand side is a char. Assigning an int into a char may result in information loss, which requires us to sign off on this risky operation with an explicit cast.

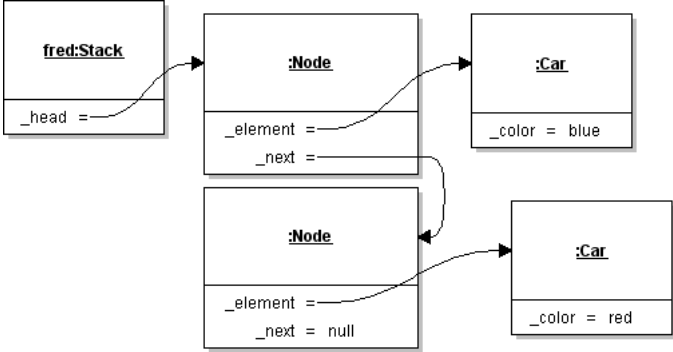
Tags	Contributor_Chris_Johnson, Skill-DebugCode, ATT-Transition-Code_to_English, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops
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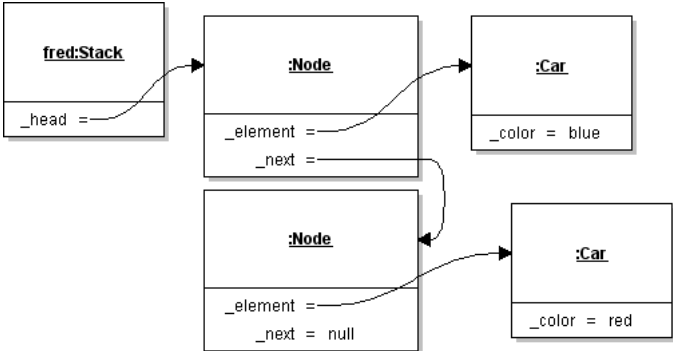
Field	Value
ID	633274 [created: 2013-06-21 08:52:15, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	Which problem is not P (assuming P!=NP)?
A	Integer knapsack
B	Single-source shortest path
C	Minimum spanning tree
D	Sorting
Explanation	Integer knapsack is considered NP-Complete.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-2-Medium, CSother, CodeLength-NotApplicable

Field	Value
ID	634126 [created: 2013-06-21 09:12:21, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	What will this code output on a 64-bit machine? <pre>int vals[10]; printf("%d\n", sizeof(vals + 0));</pre>
A	4
B	8
C	40
D	80
Explanation	sizeof(vals + 0) will get the size of the memory address of the first element in vals; a pointer is 8 bytes on the 64-bit machine
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635005 [created: 2013-06-29 22:55:08, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which algorithm is most arguably a greedy algorithm? (Circle the best answer.)
A	merge sort
B	insertion sort
C	selection sort
D	bubble sort
Explanation	Selection sort greedily takes the min/max of the array. This is a clicker question to discuss what greedy means; none of the algorithms are really greedy!
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
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ID	634978 [created: 2013-06-19 11:58:19, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	 <p>Given the "standard" set of Stack methods, what would <code>fred.pop()</code> return?</p>
A	A Node whose element is a blue Car
B	A Node whose element is a red Car
C	A blue Car
D	A red Car
E	A Stack that contains the remaining Car
Explanation	Pop removes the most-recently pushed element from the Stack and returns it. What it returns is specified by the interface, which is independent of implementation. A user should be able to interact with a stack using push, pop, peek, and isEmpty without knowing the implementation details.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Robert_McCartney, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, ATT-Type-Why, TopicWG-ADT-Stack-DefInterfaceUse, Language-Java, Bloom-4-Application, CS1, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low

Field	Value
ID	634982 [created: 2013-06-19 08:15:25, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	 <p>The above instance (or Object) diagram represents:</p>
A	A collection of Car and Node objects
B	A Node list
C	A Stack with a blue Car on top
D	A Stack with a red Car on top
E	None of the above
Explanation	The diagram represents a Stack whose top element is a blue Car. It includes a Node list, and a number of Node and Car objects, but the whole picture represents a Stack.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, Difficulty-1-Low, TopicWG-ADT-Stack-Implementations, Bloom-2-Comprehension, Language-none-none-none, CS1, CS2, CodeLength-NotApplicable

Field	Value
ID	634989 [created: 2013-06-29 22:38:46, author: patitsas (xelizabeth), avg difficulty: 2.0000]
Question	<p>Anastasiya has written code that loops over an int array named <code>a</code> which is of length N. Fill in the missing parts of the for loop's declaration.</p> <pre>int sum = 0;</pre> <div> <pre>int *p; for(p = a; ;) // complete this line { sum += *p; }</pre> </div>
A	<code>p < N; p++</code>
B	<code>p; p++</code>
C	<code>p < a + N; p++</code>
D	<code>p; p = p->next</code>
E	<code>p->next; p = p->next</code>
Explanation	p will not work as the ending condition as you don't know what's at the end of the array; N is not an appropriate ending condition as it needs to be relative from where you started. D and E are wrong as those would be for linked lists.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	633254 [created: 2013-06-18 07:25:23, author: crjirc (xchris), avg difficulty: 1.0000]
Question	You've got an algorithm that is $O(\log N)$. On the first run, you feed it a collection of size M. On the second run, you feed it a collection of size $M/2$. Assuming each run has worst-case performance, how many fewer operations does the second run take?
A	0
B	1
C	2
D	3
E	4
Explanation	The first run takes $\log M$ operations. The second run takes $\log(M/2) = \log M - \log 2 = \log M - 1$ operations. The second is just one operation less than the first.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-4-Application, Language-none-none-none, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631016 [created: 2013-06-13 13:54:32, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>In Java, what value will the variable <code>i</code> have after this declaration:</p> <pre>int i = 2 + 8 % 4;</pre>
A	0
B	2
C	4
D	4.0
E	6

Explanation	When evaluating the initialization expression, precedence requires the modulo operator % to be applied first. 8 % 4 produces the value 0, since 8 divided by 4 has a remainder of zero. When zero is then added to 2, the result is 2, which becomes the initial value of the newly declared variable.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634997 [created: 2013-06-29 22:43:05, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	<p>Assume M and N are positive integers. What does the following code print?</p> <pre> int sum=0; for (int j=0; j<M; j++) { for (int i=0; i<N; i++) { if (N%2==0) { sum += 1; } } } System.out.println(sum); </pre>
A	M
B	M^N
C	$M*N$
D	$M*N/2$
E	$M*(N/2+1)$
Explanation	The outer loop executes M times, while the inner loop executes N/2 times (i.e. if N is 6, the loop executes 3 times because there are 3 even numbers (0,2,4) between 0 and 5).
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low

Field	Value
ID	631537 [created: 2013-05-28 19:59:06, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	Which definition is not right?
A	<code>ArrayList<Character> charArray = new ArrayList<Character>();</code>
B	<code>ArrayList<Object> objectArray = new ArrayList<Object>();</code>
C	<code>ArrayList<Integer> intArray = new ArrayList<Integer>(10);</code>
D	<code>ArrayList<double> doubleArray = new ArrayList<double>(10);</code>

Field	Value
ID	630955 [created: 2013-06-13 12:12:29, author: kate (xkate), avg difficulty: 1.0000]
Question	Which of the following choices would best be modeled by a class, followed by a subclass of that class?
A	CountryInAfrica, Botswana
B	Botswana, CountryInAfrica
C	CountryInAfrica, Country
D	Country, CountryInAfrica
E	Botswana, SouthAfrica

Explanation	Choices A and B are wrong, because one of the items listed is a concrete item that would be better modeled by an object. Choice E is wrong because both items listed are concrete. Choices C and D both list a class and a subclass, but only in Choice D does the class come first, followed by the subclass.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Bloom-5-Synthesis, Language-none-none-none, CS1, LinguisticComplexity-2-Medium, TopicSimon-OOconcepts, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630938 [created: 2013-06-13 11:51:35, author: xrobert (xrobert), avg difficulty: 1.0000]
Question	In Java, the actual type of a parameter or variable's value can be any concrete class that is
A	a. the same as the declared type, or any subclass of the declared type (if the declared type is a class)
B	b. any subclass of a class that implements the declared type (if the declared type is an interface)
C	c. any class that implements the declared type (if the declared type is an interface)
D	d. All of the above
E	e. A and C above, but not B
Explanation	The declared type must be the same or more abstract than the actual type, so the actual type must be below the declared type in the class hierarchy (if both are classes), or below some class that implements the declared type in the class hierarchy if the declared type is an interface.

Field	Value
ID	631873 [created: 2013-06-17 07:07:20, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Given the code:</p> <pre> if (x >= 0) System.out.println("1"); else if (x < 20) System.out.println("2"); else System.out.println("3"); System.out.println("4"); </pre> <p>for what integer values of <input type="text" value="x"/> will <input type="text" value="2"/> be among the values printed?</p>
A	x < 0
B	x >= 0
C	x < 20
D	All values of x
E	None of the above
Explanation	The if-else clause will be executed only when the if-clause is false. So for all int values less than 0, 2 will be printed.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-06-to-24_Medium, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-1

Field	Value
ID	632081 [created: 2013-06-16 16:35:37, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What will the display look like after these lines of code, with [] representing a space?</p> <pre> float fData = 3.6239; printf("%3.1f\n", fData); </pre>
A	3.6

B	3.62
C	3.624
D	[] 3.62
E	[] [] 3.6
Explanation	The printf function follows the pattern printf("format" [, list of _fields]). Within the "format" element the field specifiers have the following format [% [-] [+] [width [.precision]] data_type], where the square brackets indicate that the element is optional. In this case %f represents a floating point element, and 3.1 the required precision of 1 decimal place.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Language-C, Bloom-2-Comprehension, TopicSimon-IO, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low

Field	Value
ID	632087 [created: 2013-06-16 15:53:17, author: tclear (xtony), avg difficulty: 0.0000]
Question	What will be output by this loop? for(n = 1, m = 5; n <= 5; n++, m--) printf("%d %d\n", n, m);
A	1 5 2 4 3 3 4 2 5 1
B	1 4 2 3 3 2 4 1 5 0
C	5 1 4 2 3 3 2 4 1 5
D	1 5 2 4 3 3 4 2
E	1 4 2 3 3 2 4 1
Explanation	The loop increments the value of n and decrements the value of m on each iteration printing the value of each variable, until n reaches the terminal value of 5
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-IO, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-Params-SubsumesMethods

Field	Value
ID	632114 [created: 2013-06-17 20:55:29, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What would be the performance of a method called addAfter(p), in which p is a position of a node or an index of an array, if the data structure is implemented by an

	array or linked list structure respectively?
A	O(1), O(1)
B	O(1), O(n)
C	O(n), O(1)
D	O(n), O(n)

Field	Value
ID	634935 [created: 2013-06-19 17:47:28, author: xrobert (xrobert), avg difficulty: 2.0000]
Question	<pre>public class RecursiveMath { ... public int fib (int a) { if (a == 1) return 1; else return fib(a-1) + fib(a-2); } ... }</pre> <p>Given the above definition, what is the result of executing the following?</p> <pre>RecursiveMath bill = new RecursiveMath(); int x = bill.fib(-1);</pre>
A	x is set to -1
B	x is set to undefined
C	The code does not terminate
D	The code cannot be executed, because it won't compile
E	None of the above
Explanation	The problem: When we invoke fib(-1), a gets bound to -1; since that is not equal to 1, we call fib(-2) and fib(-3), and so on. We keep making recursive calls, and the parameter will never be equal to 1 since we are getting further away from 1 with each call. So it will not terminate.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-1-Low, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	634951 [created: 2013-06-19 14:26:38, author: crjrc (xchris), avg difficulty: 1.0000]
Question	You don't know exactly how much data you need to store, but there's not much of it. You'd like to not allocate any memory that won't be used. You do not need to be able to search the collection quickly. What is the simplest data structure that best suits for your needs?
A	Unordered array
B	Ordered array
C	Linked list
D	Hashtable
E	Binary search tree
Explanation	Since arrays must be allocated before they are used, we tend to overallocate to make sure we have sufficient capacity. This wastes space. If we're not exactly sure of how much storage we need and without a need for fast searching, a linked list is a good choice.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618972 [created: 2013-05-29 04:50:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which of the choices will produce the same result as the following statement? <pre>if (mark == 'A' && GPA > 3.5) System.out.println("First Class"); else System.out.println("Not First Class");</pre>
A	<pre>if (mark != 'A' && GPA <= 3.5) System.out.println("First Class"); else System.out.println("Not First Class");</pre>
B	<pre>if (mark != 'A' GPA <= 3.5) System.out.println("First Class"); else System.out.println("Not First Class");</pre>
C	<pre>if (mark == 'A' GPA > 3.5) System.out.println("First Class"); else System.out.println("Not First Class");</pre>
D	<pre>if (mark != 'A' GPA <= 3.5) System.out.println("Not First Class"); else System.out.println("First Class");</pre>

Field	Value
ID	618968 [created: 2013-05-29 04:44:15, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which one of the following assignments will be resulted in 1.0?
A	double x = 6.0/4.0;
B	double y = (int)6.0/4.0;
C	double z = (int)(6.0/4.0);
D	double t = 6.0/(int)4.0;

Field	Value
ID	618663 [created: 2013-05-28 21:22:07, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	If class test is going to listen to an event, which statement, if added to the following code, cannot be a solution for event handling? <pre>public class test implements ActionListener{ JButton okButton; public static void main(String [] args){ SimpleGui_V2 firstGui = new SimpleGui_V2(); firstGui.draw(); } public void draw(){</pre>

	<pre> JFrame rootFrame = new JFrame(); okButton = new JButton("OK"); // missing code rootFrame.add(okButton); } public void actionPerformed (ActionEvent event){ if (okButton.getText().compareToIgnoreCase("ok")== 0) okButton.setText("clicked"); else okButton.setText("OK"); } } </pre>
A	okButton.addActionListener(new test());
B	okButton.addActionListener(this);
C	okButton.addActionListener(new ActionListener());
D	<pre> okButton.addActionListener(new ActionListener(){ public void actionPerformed (ActionEvent event){ if (okButton.getText().compareToIgnoreCase("ok")== 0) okButton.setText("clicked"); else okButton.setText("OK"); } }); </pre>

Field	Value
ID	618661 [created: 2013-05-28 21:19:54, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>A compiler error existed in this code. Why is that happening?</p> <pre> public class test { final int testCount1; final static int testCount2; static int testCount3; int testCount4; } </pre>
A	testCount1 and testCount2 have not been initialized.
B	testCount2 and testCount3 have not been initialized.
C	testCount3 and testCount4 have not been initialized.
D	None of the instance variables have been initialized.

Field	Value
ID	618658 [created: 2013-05-28 21:18:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>A compiler error existed in this code. Why is that happening?</p> <pre> public class test { final int testCount; int classCount; public int getCount(){ </pre>

	<pre> return testCount+classCount; } }</pre>
A	testCount and classCount have not been initialized.
B	testCount has not been initialized.
C	classCount has not been initialized.
D	testCount and classCount cannot be added in return statement.

Field	Value
ID	632134 [created: 2013-06-17 22:02:22, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>consider the section of code below:</p> <pre> int a = 3, b = 4, c = 5; x = a * b <= c What will x be after executing this code?</pre>
A	0
B	1
C	3
D	12
E	17
Explanation	Due to the precedence of operators here, first a and b are multiplied and then the total [12] is compared with c [5]. If the logical comparison evaluates to true x assumes the value 1, otherwise (as in this case) , it evaluates to false and x assumes the value 0.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	618643 [created: 2013-05-28 21:11:37, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	<p>What would be the output?</p> <pre> Vector<Object> vect_1 = new Vector<Object>(); Vector<Integer> vect_2 = new Vector<Integer>(); vect_1.addElement(1); vect_1.addElement(2); vect_2.addElement(3); vect_2.addElement(4); vect_1.addElement(vect_2); System.out.print(vect_1.toString()); System.out.print(vect_1);</pre>
A	This is a compiler Error. A vector of type Integer cannot be added to a vector of type Object.
B	[1, 2, [3, 4]]
C	[1, 2, 3, 4]
D	[1, 2, [3, 4]][1, 2, [3, 4]]

Field	Value

ID	632179 [created: 2013-06-18 00:28:09, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>How many times will the printf statement be executed in this piece of code?</p> <p>In each case assume the definition</p> <pre>int i = 0; WARNING There are some very nasty traps in some of the code here. LOOK AT IT ALL VERY CAREFULLY! while (i < 20) { if (i = 2) printf("Count me!"); i++; }</pre>
A	0
B	1
C	19
D	20
E	an infinite number
Explanation	The program fails the test of equality on the first pass through as i=0, so falls through the if statement without incrementing the index. This triggers the while loop again (which again fails the equality test as the index remains at 0) and the program loops in an endless cycle.
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-3-High, Language-C, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632182 [created: 2013-06-18 00:41:00, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>How many times will the printf statement be executed in this piece of code?</p> <p>In each case assume the definition</p> <pre>int i = 0; WARNING There are some very nasty traps in some of the code here. LOOK AT IT ALL VERY CAREFULLY! for(i = 0; i <= 3; i++) { switch (i) { case 0: puts("Case 0"); break; case 1: puts("Case 1"); case 2: puts("Case 2"); default: printf("Count me!"); } }</pre>
A	0
B	1
C	2
D	3
E	an infinite number
Explanation	The code iterates until the index reaches 3 (a total of four times) but on the first iteration the case statement break before executing the printf function. On

	subsequent iterations the printf function is executed, twice by matching the index values and once by default.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	633219 [created: 2013-06-12 05:54:40, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	This sorting algorithm starts by finding the smallest value in the entire array. Then it finds the second smallest value, which is the smallest value among the remaining elements. Then it finds the third smallest value, the fourth, and so on.
A	selection sort
B	insertion sort
C	bubble sort
D	quick sort
E	merge sort
Explanation	This procedure describes the steps of the selection sort, which repeatedly selects out the ith smallest element.
Tags	Contributor_Chris_Johnson, ATT-Transition-English_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633377 [created: 2013-06-19 07:37:54, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	You see the expression <code>n = 128</code> in some code that successfully compiles. What type can <code>n</code> not be?
A	int
B	char
C	byte
D	float
E	double
Explanation	Bytes only hold values in [-128, 127].
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618979 [created: 2013-05-29 05:00:47, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	Which one of the codes below will NOT compute the summation of 10 consecutive even numbers starting from zero?
A	<pre>sum = 0; for (int i = 0; i < 20 ; i = i+2){ sum+=i; }</pre>
B	<pre>sum = 0; for (int i = 0; i < 10 ; i++){ sum+=i*2; }</pre>
C	<pre>sum = 0;</pre>

	<pre> for (int i = 0; i < 10; i = i + 2){ sum += i; } </pre>
D	<pre> sum = 0; for (int i = 0; i < 20; i++){ sum += i/2; } </pre>

Field	Value
ID	632088 [created: 2013-06-17 20:28:34, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be printed by this code?</p> <pre> public static void main(String [] args){ int [] number = {1, 2, 3}; changeNumber (number); for (int i=0; i<number.length; i++) System.out.print(number[i] + " "); } public static void changeNumber(int [] number){ for (int i=0; i<number.length; i++) number[i] *=2; } </pre>
A	1 2 3
B	2 4 6
C	2 2 2
D	0 0 0

Field	Value
ID	627740 [created: 2013-06-07 08:21:18, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>The following method <code>isSorted</code> should return <code>true</code> if the array <code>x</code> is sorted in ascending order. Otherwise, the method should return <code>false</code> :</p> <pre> public boolean isSorted (int[] x) { //missing code goes here } </pre> <p>Which of the following is the missing code from the method <code>isSorted</code>?</p>
A	<pre> boolean b = true; for (int i=0; i<x.length-1; i++) { if (x[i] > x[i+1]) b = false; else b = true; } return b; </pre>
B	<pre> for (int i=0; i<x.length-1; i++) { if (x[i] > x[i+1]) return false; } return true; </pre>
C	

	<pre> boolean b = false; for (int i=0; i<x.length-1; i++) { if (x[i] > x[i+1]) b = false; } return b; </pre>
D	<pre> boolean b = false; for (int i=0; i<x.length-1; i++) { if (x[i] > x[i+1]) b = true; } return b; </pre>
E	<pre> for (int i=0; i<x.length-1; i++) { if (x[i] > x[i+1]) return true; } return false; </pre>
Explanation	<p>This code should check each pair of consecutive values in the array and return false (that is, the array is not sorted) if it finds a single pair where the first value is greater than the second.</p> <p>Choice A is wrong because its answer depends only on the relationship of the last two values it checks. Choice C is wrong because it always returns <code>false</code>. Choices D and E are wrong because they return <code>false</code> when the array <i>is</i> sorted and <code>true</code> when it isn't.</p>
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, ATT-Type-How, Skill-WriteCode_MeansChooseOption, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-3-Relations, Bloom-2-Comprehension, Language-Java, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-25-or-more_High, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	627747 [created: 2013-06-07 08:47:28, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>For the purposes of this question, two code fragments are considered to be equivalent if, when they are run using the same input, they always produce the same output. Which line could be removed from the following code fragment so that the resulting code fragment is equivalent to the original one?</p> <pre> 1. Scanner kbd = new Scanner(System.in); 2. int x, product; 3. x = -1; 4. product = 1; 5. x = kbd.nextInt(); 6. while (x >= 0) { 7. if (x > 0) { 8. product *= x; 9. } 10. x = kbd.nextInt(); 11. } 12. System.out.println(product); </pre>
A	Line 3
B	Line 4
C	Line 5
D	Line 8
E	Line 10
Explanation	Line 3 can be removed because x is initialized again in line 5, before it is ever used.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-ModifyCode, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	618982 [created: 2013-05-29 05:05:50, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	<p>What will be outputted?</p> <pre>char initial = 'a'; switch (initial){ case 'a': System.out.print("a"); case 'A': System.out.print("A"); break; case 'b': System.out.print("B"); default: System.out.print("C"); break; }</pre>
A	a
B	aA
C	aAB
D	aABC

Field	Value
ID	634146 [created: 2013-06-24 10:10:06, author: patitsas (xelizabeth), avg difficulty: 1.7500]
Question	Depth-first traversal is kind of like selection sort, in the same way that breadth-first traversal is like what sorting algorithm?
A	Radix sort
B	Bubblesort
C	Heapsort
D	Quicksort
E	Insertion sort
Explanation	Insertion sort is breadth-first-like as you keep increasing the "breadth" of the array that is sorted.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-3-High, ExternalDomainReferences-1-Low, TopicWG-Graphs, Bloom-5-Synthesis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Other, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
ID	633872 [created: 2013-06-23 12:26:40, author: patitsas (xelizabeth), avg difficulty: 0.6667]
Question	<p>Thomas has the following program that he is running on a 64-bit machine:</p> <pre>#include<stdlib.h> int main() { int x = rand(); int y = rand(); }</pre>

	What is not true about y?
A	y is less than RAND_MAX
B	y is four bytes in size
C	y is stored in the same stack frame as x
D	y's value cannot be deduced from x's
Explanation	y <= RAND_MAX, not y < RAND_MAX. As rand has not been seeded, and is pseudorandomly generated, y can theoretically be deduced from x.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-Lifetime, CS2, LinguisticComplexity-2-Medium, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	617887 [created: 2013-05-27 22:25:43, author: quintincutts (xquintin), avg difficulty: 0.0000]
Question	<p>Consider the following output consisting of a block of stars, with no spaces between each star, and no blank lines in between the lines of stars:</p> <pre>***** ***** ***** *****</pre> <p>Considering a plan for a program to print out this shape, which of the following would be your main control structure?</p>
A	sequence
B	selection
C	repetition
D	or something else
Explanation	<p>Analysing the output, we have four rows of five stars, exactly on top of one another. Textual output (in almost any language) is row by row, moving downwards - meaning that if we print something out on one line, and then print something on the next line, we cannot go back up to the previous line and print out some more.</p> <p>Thinking this way, we can create this output by writing out each line, one at a time. Every line is the same, and there are four lines in total. This, then, can be written as a repetition:</p> <pre>repeat four times: write out one line of stars</pre> <p>If you picked "sequence", maybe you were thinking of:</p> <pre>write out one line of stars write out one line of stars write out one line of stars write out one line of stars</pre> <p>This is a correct answer, but not as elegant as the solution using repetition. If you had 100 lines to write out, would you want to enter them all? And if you made a mistake in the line, you'd need to edit it in 100 places... ugh!</p>

Field	Value
ID	630978 [created: 2013-06-13 12:49:13, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Which of the following recommendations for testing software is good advice?
A	Limit your test cases to one assertion, since each test should check only one expected outcome.

B	Save your testing until after the solution is completely written, so you can concentrate solely on testing without distractions.
C	Test a program with all possible values of input data.
D	Test each piece of your solution as you build it, so you will find errors as quickly as possible.
E	Longer tests that focus on combinations of multiple features are preferable, because they test your code more strenuously.
Explanation	Incrementally testing your code as you write it helps you find errors more quickly, and ensures that new work builds on previous work you have already confirmed works. The other four choices here represent less effective or impractical advice.
Tags	ATT-Transition-English_to_English, Contributor_Stephen_Edwards, Skill-TestProgram, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicSimon-Testing

Field	Value
ID	632602 [created: 2013-06-19 15:34:47, author: kate (xkate), avg difficulty: 1.0000]
Question	Which of the following is not an abstract datatype?
A	List
B	Queue
C	Hashtable
D	Array
E	Both C and D
Explanation	Hashtables and arrays are data structures, not abstract datatypes. Note: This question was written by A. Luxton-Reilly. K. Sanders entered and tagged the question and added choice E, after A. Luxton-Reilly had to withdraw from the WG due to illness.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, TopicWG-ADT-List-DefInterfaceUse, Skill-PureKnowledgeRecall, TopicWG-ADT-Queue-DefInterfaceUse, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, Contributor_Andrew_Luxton-Reilly

Field	Value
ID	634970 [created: 2013-06-27 03:59:21, author: mikeyg (xmikey), avg difficulty: 1.0000]
Question	What algorithm does <i>mystery</i> implement, when a list of values is passed in as its argument? <pre>def mystery (listOfVals): current = 1 while (current < len(listOfVals)): pivot = listOfVals[current] underExam = current - 1 while ((underExam >= 0) and (listOfVals[underExam] > pivot)): listOfVals[underExam+1] = listOfVals[underExam] underExam = underExam - 1 listOfVals[underExam+1] = pivot current = current + 1 return (listOfVals)</pre>
A	Insertion Sort
B	Quicksort
C	Selection Sort
D	List Reverser
E	Bubble Sort
Explanation	This is a classic implementation of Insertion Sort. Each item in the list is repeatedly <i>inserted</i> into its correct spot in the portion of the list already sorted.

Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-3-High, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicWG-Sorting-Quadratic
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Field	Value
ID	633288 [created: 2013-06-18 07:39:13, author: crjirc (xchris), avg difficulty: 1.5000]
Question	What operation contributes the log N to heap sort's $O(N \log N)$ complexity?
A	Trickling up only
B	Trickling down only
C	Both trickling up and trickling down
D	Searching the array
E	Splitting the array in half
Explanation	The heapsort involves inserting all elements and removing all elements. Inserting requires a trickle up and removing requires a trickle down.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632878 [created: 2013-06-11 07:22:11, author: crjirc (xchris), avg difficulty: 1.0000]
Question	We say indexing is fast if it's done in $O(1)$ time, searching is fast if done in $O(\lg N)$ time, and inserting and deleting are fast if done in $O(1)$ time. Compared to other data structures, sorted arrays offer:
A	slow indexing, slow search, slow insertions and deletions.
B	fast indexing, fast search, slow insertions and deletions.
C	fast indexing, slow search, slow insertions and deletions.
D	slow indexing, slow search, fast insertions and deletions.
E	slow indexing, fast search, fast insertions and deletions.
Explanation	Sorted arrays can be indexed in constant time (which is fast), searched in $O(\lg N)$ time (which is fast), and restructured in $O(N)$ time (which is not as good as $O(1)$ time).
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicWG-ChoosingAppropriateDS, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633662 [created: 2013-06-22 10:40:40, author: jspacco (xjaime), avg difficulty: 0.5000]
Question	True or False: Public methods and public variables are the only part of your class that clients can access and use.
A	True
B	False
Explanation	Clients can also inherit protected variables. If you are writing code that will be used by clients, you need to think carefully about whether you want clients to extend your classes, and if so, how.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
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ID	634139 [created: 2013-06-24 09:50:21, author: patitsas (xelizabeth), avg difficulty: 2.0000]
Question	<p>Jack has the code below. What will it print out?</p> <pre>int array[] = { 45, 67, 89, 22, 13 };</pre> <pre>int *array_ptr = &array[1]; printf("%d, ", array_ptr[1]); printf("%d, ", *(array_ptr++)); printf("%d, ", *array_ptr++); printf("%d\n", *array_ptr);</pre>
A	67, 67, 67, 89
B	67, 45, 67, 89
C	89, 67, 89, 22
D	89, 89, 89, 67
E	67, 89, 22, 22
Explanation	The array pointer starts at the second element; the incrementing is done post-evaluation.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-3-Analysis, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-3-High, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633258 [created: 2013-06-18 07:11:11, author: crjrc (xchris), avg difficulty: 0.5000]
Question	Which of the following is not a reason why wall clock time is a poor measure of an algorithm's performance?
A	It's dependent on processor speed.
B	Other programs may interrupt the one being measured.
C	The input cases may not capture the worst case running time.
D	Different platforms measure wall clock time differently.
E	Subsequent runs may read data from cache instead of disk.
Explanation	Wall clock time is a measure of real elapsed time between two events, which is no different from one computer to the next.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	629925 [created: 2013-06-11 05:01:21, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>Choose the answer that best describes how to compute the value of the following Java arithmetic expression:</p> $4 * 3 + 6 / 4$
A	Evaluate the operations from left to right: * then + then /.
B	Evaluate * and / first (from left to right), and then evaluate +.
C	Round the answer to 6/4 towards 0.
D	A and C.
E	B and C.
Explanation	In Java, multiplication and division have higher precedence than addition, and division is closed under ints.
Tags	Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-Why, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, TopicSimon-ArithmeticOperators,

Block-Vertical-1-Atom, Language-Java, Bloom-4-Application, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631540 [created: 2013-06-15 19:16:00, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	How many times will F be called if n = 5, ignoring F(5) itself? <pre>public static long F(int n) { if (n == 0) return 0; if (n == 1) return 1; return F(n-1) + F(n-2); }</pre>
A	15
B	12
C	7
D	5

Field	Value
ID	633238 [created: 2013-06-12 23:28:50, author: crjjrc (xchris), avg difficulty: 2.0000]
Question	Compared to a sorted linked list, a balanced binary search tree offers
A	slower searching and faster insertion
B	slower searching and slower insertion
C	the same performance for searching and insertion
D	faster searching and slower insertion
E	faster searching and faster insertion
Explanation	Insertion is O(n) for a sorted linked list, as we must traverse the list to find the correct insertion point. Searching is O(n) since we only have sequential access; the binary search does not work for linked lists. Balanced BSTs can be traversed in O(lg N) time, making it faster for both operations.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_English, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-3-Relations, TopicWG-LinkedLists, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633576 [created: 2013-06-19 15:16:02, author: crjjrc (xchris), avg difficulty: 2.0000]
Question	You need to sort an array but have no extra memory to spare. Which algorithm do you avoid?
A	bubble sort
B	merge sort
C	quick sort
D	heap sort
E	insertion sort
Explanation	Merge sort requires a secondary array to merge into.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-3-Relations, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633571 [created: 2013-06-19 15:45:44, author: crjrc (xchris), avg difficulty: 1.0000]
Question	Which of the following is true of a Java interface?
A	Instance variables are allowed, but they must be public.
B	Private methods may not be declared.
C	Static and final constants may not defined.
D	Methods may have implementations provided they are marked <code>final</code> .
E	All methods must be explicitly declared <code>abstract</code> .
Explanation	All methods in an interface are public, even if you leave off the access modifier.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, TopicWG-JavaInterface, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634129 [created: 2013-06-24 07:56:34, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	<p>After calling the following function, what will the values of n and m be? Assume that before calling the function, n = 2 and m = 5.</p> <pre>void example(int *n, int *m) { *n++; *m += 5; }</pre> <pre>void main() { int n = 2; int m = 5; example(&n, &m); printf("n = %d and m = %d", n, m); }</pre>
A	n = 2 and m = 5
B	n = 3 and m = 5
C	n = 2 and m = 10
D	n = 3 and m = 10
Explanation	Due to order of operations, the ++ will not change n.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-06-to-24_Medium, TopicSimon-Scope-Visibility, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630653 [created: 2013-06-12 23:32:40, author: crjrc (xchris), avg difficulty: 2.0000]
Question	Finding the maximum value in a complete and balanced binary search tree is
A	O(1)
B	O(log N)
C	O(N)
D	O(N ²)

E	O(N log N)
Explanation	The maximum is the root's right-most descendent, which can be reached in log N steps.
Tags	Contributor_Chris_Johnson

Field	Value
ID	633568 [created: 2013-06-19 14:36:17, author: crjrc (xchris), avg difficulty: 1.0000]
Question	You need to store a large amount of data that can be searched quickly by some key, but you don't know exactly how many elements you'll need to store. You want to waste no storage space. The elements to be added are in random order. What is the simplest data structure that meets your needs?
A	Ordered array
B	Linked list
C	Hashtable
D	Binary search tree
E	Self-balancing tree
Explanation	Hashtables provide fast searching, but they may waste storage space. A tree makes better use of memory. Since the keys are in a random order, it's likely a binary tree will end up balanced just through the insertion price.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSSpeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633235 [created: 2013-06-12 23:13:29, author: crjrc (xchris), avg difficulty: 1.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getFalse() && getFalse(); } } </pre>
A	FF
B	T
C	TF
D	F
E	Nothing is printed.
Explanation	The first operand is false. && requires both operands to be true, so we don't bother evaluating the second.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
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ID	618480 [created: 2013-05-28 19:39:50, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>It is desired to have an output as shown below as a consequence of running the following code. What would be the type of <i>st1</i>?</p> <pre> _____ st1 = new _____ ("Measure twice, cut once"); System.out.println(st1); System.out.println(st1.toUpperCase()); System.out.println(st1); Measure twice, cut once MEASURE TWICE, CUT ONCE Measure twice, cut once </pre>
A	String
B	StringBuffer
C	StringBuilder
D	All of the above is possible

Field	Value
ID	618492 [created: 2013-05-28 19:46:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What package should be imported for this code to work correctly?</p> <pre> ArrayList<Integer> intValues = new ArrayList<Integer> (); public void add (){ for (int i=0; i <50; i++) intValues.add(i); } </pre>
A	java.util
B	java.lang
C	java.io
D	java.math

Field	Value												
ID	635039 [created: 2013-06-29 23:35:51, author: patitsas (xelizabeth), avg difficulty: 0.0000]												
Question	<div>Nathalin has created an integer array arr containing 5 zeros. Fill in the table:</div> <table><tr><th>Variable name</th><th>Variable's address</th><th>Variable's value</th></tr><tr><td>arr</td><td>0x00123abc00</td><td>0x00123abc00</td></tr><tr><td>arr[0]</td><td>A</td><td>0</td></tr><tr><td>arr[1]</td><td>B</td><td>0</td></tr></table>	Variable name	Variable's address	Variable's value	arr	0x00123abc00	0x00123abc00	arr[0]	A	0	arr[1]	B	0
Variable name	Variable's address	Variable's value											
arr	0x00123abc00	0x00123abc00											
arr[0]	A	0											
arr[1]	B	0											
A	A = 0x00123abc00, B = 0x00123abc04												
B	A = 0x00123abc04, B = 0x00123abc04												
C	A = 0x00123abc04, B = 0x00123abc08												
D	A = 0, B = 0												
E	A = 0x00123abc00, B = 0x00123abc00												
Explanation	arr[0] has the same addresss as arr does. arr[1] will have arr[0]'s mem address + sizeof(arr[0]), which is 4.												
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-												

Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618503 [created: 2013-05-28 19:55:54, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>If we know the length of the string used in our program is almost 200, is there any difference between these following definitions in terms of performance?</p> <pre>Stringbuilder string1 = new Stringbuilder(); Stringbuilder string2 = new Stringbuilder(50); Stringbuilder string3 = new Stringbuilder(100);</pre>
A	No, there is no performance difference.
B	Yes, the definition of string1 is better.
C	Yes, the definition of string2 is better.
D	Yes, the definition of String3 is better.

Field	Value
ID	632120 [created: 2013-06-14 00:01:24, author: tclear (xtony), avg difficulty: 1.0000]
Question	<p>Consider these lines of code:</p> <pre>txtName.SetFocus txtName.SelStart = 0 txtName.SelLength = Len(txtName.Text) txtName is an edit text box which is currently visible.</pre> <p>What is the code expected to do?</p>
A	Clear the text in txtName.
B	Copy the text in txtName to the clipboard.
C	Fill txtName with text pasted from the clipboard.
D	Highlight all the text in txtName.
E	Remove the highlight from all the text in txtName.
Explanation	The code sets focus to the text box and by selecting the focus area from start of the text box to its end thereby highlights the contents
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-2-Comprehension, TopicSimon-GUI-Design-Implementat, Language-VB, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	618563 [created: 2013-05-28 20:31:10, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Depending on which delimiter is used in the following code, which output will be resulted respectively?</p> <pre>String input = "Keep your friends close and your enemies closer"; Scanner sc_input = new Scanner(input).useDelimiter("_____"); while (sc_input.hasNext()) System.out.println(sc_input.next()); sc_input.close();</pre> <p>I. \\s*close\\s II. \\s*close\\s* III. \\s*close</p>
A	I.

	<p>Keep your friends and your enemies closer</p> <p>II.</p> <p>Keep your friends and your enemies closer</p> <p>III.</p> <p>Keep your friends and your enemies</p> <p>r</p>
B	<p>I.</p> <p>Keep your friends and your enemies closer</p> <p>II.</p> <p>Keep your friends and your enemies</p> <p>r</p> <p>III.</p> <p>Keep your friends and your enemies</p> <p>r</p>
C	<p>I.</p> <p>Keep your friends and your enemies closer</p> <p>II.</p> <p>Keep your friends and your enemies</p> <p>r</p> <p>III.</p> <p>Keep your friends and your enemies</p> <p>r</p>
D	<p>I.</p> <p>Keep your friends and your enemies closer</p> <p>II.</p> <p>Keep your friends and your enemies closer</p> <p>III.</p> <p>Keep your friends and your enemies</p> <p>r</p>

Field	Value
ID	632084 [created: 2013-06-16 16:19:36, author: tclear (xtony), avg difficulty: 0.0000]
Question	Before testing an executable version of your program with data from a test file using DOS redirection, you should remove all calls to fflush from your program. Why is this necessary?

A	fflush is not part of the ANSI C standard.
B	fflush is for debugging only. It causes a run time error in an exe file.
C	fflush would read and ignore all remaining data in the test file.
D	fflush is not in any QuickC library.
E	fflush does not echo output to the screen.
Explanation	fflush would read and ignore all remaining data in the test file, as it has already flushed the input buffer
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-3-Relations, Language-C, TopicSimon-FileIO, Bloom-3-Analysis, CS1

Field	Value
ID	618556 [created: 2013-05-28 20:26:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	To let the <i>Scanner</i> <code>sc = new Scanner(System.in);</code> statement works fine, which package should be imported?
A	java.util
B	java.io
C	java.lang
D	java.Scanner

Field	Value
ID	632098 [created: 2013-06-17 20:36:43, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	Suppose we have an arbitrary number of entries that each includes a key and a value. We never need to search the entries while the rule for insertion and removal is first-in-last-out. Which data structure is proper?
A	one dimensional array
B	two dimensional array
C	single linked list
D	double linked list

Field	Value
ID	632110 [created: 2013-06-14 22:24:28, author: tclear (xtony), avg difficulty: 0.0000]
Question	I have a number of different forms in my program, and have help topics explaining how each should be used. When the users presses F1, I want the appropriate help topic to appear depending on which form is currently open. What is the easiest way to achieve this?
A	Set the HelpContextID property of the Application object to the appropriate ID value.
B	Set the HelpContextID property of each form to the appropriate ID value.
C	Set the HelpContext property of a Common Dialog control to the appropriate ID value.
D	Set the HelpCommand property of a Common Dialog control to the appropriate ID value.
E	Rewrite the help as a number of different help files, one for each form. Use a different HelpFile property for each form.
Explanation	The HelpContextID property is used to link a user interface element (such as a control, form, or menu) to a related topic in a Help file. The HelpContextID property must be a Long that matches the Context ID of a topic in a WinHelp (.hlp) or HTML Help (.chm) file. source http://msdn.microsoft.com/en-us/library/aa261329%28v=vs.60%29.aspx
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-VB, TopicSimon-IO, CS1, CodeLength-NotApplicable, TopicSimon-ProgramDesign

Field	Value
ID	618487 [created: 2013-05-28 19:44:08, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>To make the following code work without any error, one of the given solutions is not right. Which one is it?</p> <pre> class D { int Diameter; public D(int d){ Diameter = d; } } public class E { public static void main(String arg[]){ D diam = new D(); } } </pre>
A	To omit the input argument of the constructor.
B	To define diam by passing an int value to constructor.
C	To define a null constructor.
D	To define the constructor private.

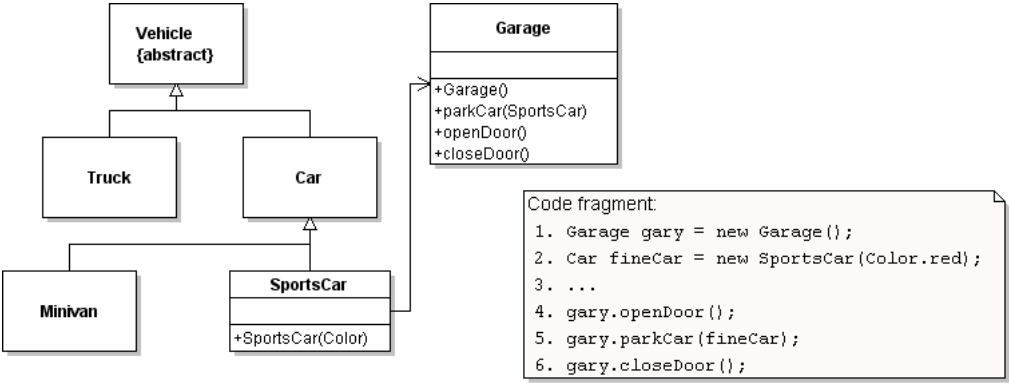
Field	Value
ID	630992 [created: 2013-06-13 13:17:04, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	Suppose you are writing a method in a new class. You are also writing unit test cases to demonstrate that this method works correctly. You know you have written enough test cases to demonstrate the method works as desired when?
A	You have written at least one test case that uses the method.
B	You have written separate test cases for each identifiable "group" of input values and/or output values where the behavior is expected to be similar.
C	You have written at least one test case for every input value that can be given to the method.
D	You have written at least one test case for every output value that can be produced by the method.
E	You have written at least one test case for every input/output value combination that can be given to/produced by the method.
Explanation	For most interesting methods, there are too many possible input values and/or output values for you to check them all. However, checking just one input our output is insufficient for methods that do anything sophisticated. As a result, it is often helpful to think of the different cases or "equivalence classes" of input/output values where the methods behaves similarly, and ensure you test each such group separately. Often, writing multiple tests for each group--so that you can double-check the method's behavior "at the boundary" of the group--is especially helpful.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Stephen_Edwards, Skill-TestProgram, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, CS1, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	618540 [created: 2013-05-28 20:19:27, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	<p>Is there any error in this code?</p> <pre> String [] firstNames = {"Neda", "Dorsa"}; int [] ages = {10, 14}; if (ages[0]>ages[1]) if (firstNames[0]> firstNames [1]) System.out.print(firstNames[0] + "has the priority"); else System.out.print("They both have the same priority"); </pre>

	else System.out.print(firstNames[1] + "has the priority");
A	Yes, wrong operator has been used for string type.
B	Yes, wrong operator has been used for int type.
C	Yes, array is out of bound.
D	This code has no Error.

Field	Value
ID	630999 [created: 2013-06-13 13:33:44, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the incomplete code segment below. The segment is supposed to initialize a 4 x 4 matrix as shown in this image:</p> <pre> 4 1 0 0 1 4 1 0 0 1 4 1 0 0 1 4 </pre> <pre> final int SIZE = _____; // line 0 int matrix[][] = new int[SIZE][SIZE]; // line 1 for (int i = 0; i < SIZE; i++) // line 2 { for (int j = 0; j < SIZE; j++) // line 3 { if (_____) // line 4 { matrix[i][j] = 4; // line 5 } else if (_____) // line 6 { matrix[i][j] = 1; // line 7 } else { matrix[i][j] = 0; // line 8 } } } </pre> <p>Select statement from the choices below that is the best choice to fill in the blank on line 0 of this code segment so that it behaves as desired.</p>
A	3
B	4
C	5
D	16
E	None of these
Explanation	The constant SIZE is used to define the width and height of the array (matrix), which is 4x4.
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-Constants, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	634922 [created: 2013-05-28 12:49:33, author: xrobert (xrobert), avg difficulty: 2.0000]
Question	



Given this class diagram, what best describes what happens with the code fragment above?

A	The code compiles and executes fine
B	Code fails at compile time, error in line 2
C	Code fails at execution time, error in line 2
D	Code fails at compile time, error in line 5
E	Code fails at execution time, error in line 5
Explanation	The code will not compile due to the error in line 5: gary's parkCar method takes a parameter of type SportsCar, but fineCar's declared type is Car. Even though fineCar's actual type is SportsCar, the compiler will not let a variable declared as a superclass of the parameter's type be used in the method. Line 2 has no problems, as having the actual type be a subclass of the declared type is legitimate.
Tags	ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, Difficulty-2-Medium, TopicSimon-Assignment, Language-Java, Bloom-3-Analysis, CS1, CodeLength-lines-00-to-06_Low, Neo-Piaget-4-Formal_Operational, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631009 [created: 2013-06-13 13:45:16, author: edwards@cs.vt.edu (xstephen), avg difficulty: 1.0000]
Question	<p>Consider the incomplete code segment below. The segment is supposed to initialize a 4 x 4 matrix as shown in this image:</p> <div><div>4100</div><div>1410</div><div>0141</div><div>0014</div></div> <pre>final int SIZE = _____; // line 0 int matrix[][] = new int[SIZE][SIZE]; // line 1 for (int i = 0; i < SIZE; i++) // line 2 { for (int j = 0; j < SIZE; j++) // line 3 { if (_____) // line 4 { matrix[i][j] = 4; // line 5 } else if (_____) // line 6 { matrix[i][j] = 1; // line 7 } else { matrix[i][j] = 0; // line 8 } } }</pre> <p>Select statement from the choices below that is the best choice to fill in the blank on line 4 of this code segment so that it behaves as desired.</p>
A	<div>i == j - 1</div>

B	<code>i == j</code>
C	<code>i == j + 1</code>
D	<code>Math.abs(i - j) == 1</code>
E	None of these
Explanation	Line 4 controls where the "4" values are placed in the two-dimensional array. They should be placed at all locations where i and j differ by 1.
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	634910 [created: 2013-06-19 13:26:14, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	Let's call the index at which an element is placed in an otherwise empty hashtable index h. With open addressing, a key-value pair may collide with another and be placed in a different location according to some defined scheme. Where may a key-value pair be placed?
A	anywhere in the array
B	at a list stored at index h
C	at index h or after
D	at index h or before
Explanation	With open addressing, some sort of probing algorithm is used to resolve collisions. Probing involves stepping along from the collision index to a subsequent element whose distance is determined by some step size. This probing visits all elements of the array, if need be.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618667 [created: 2013-05-28 21:23:28, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	We have defined two JButton in a class and are going to handle the events by implementing ActionListener. As we know, this interface has a method called actionPerformed that we have to override it in our class. What would be the best way (i.e. object oriented approach) to listen to the events regarding both the buttons?
A	Override actionPerformed method twice for both the buttons.
B	Override actionPerformed method once, get the source of event in this method and then handle the events.
C	Create two separate classes, each should implements ActionListener interface. Then register each button with each classes.
D	use inner classes, each implements ActionListener interface. Each button should be registered with one of these inner classes.

Field	Value
ID	634919 [created: 2013-06-29 21:34:03, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Grace has written a method to pop from a stack; fill in the pre-condition. <pre>struct node* pop(struct node **head)</pre> <pre>{ // pops the stack pointed to by head; does nothing to alter that node // PRE: // POST: head now points to what was the second element of the list struct node* to_pop = *head; *head = (*head)->next; return to_pop; }</pre>
A	head != NULL

B	*head != NULL
C	**head != NULL
D	to_pop != NULL
Explanation	*head != NULL is the best answer of A-C as it has the closest level of detail to what is used in the code
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	634980 [created: 2013-06-19 15:43:37, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following statements about binary search algorithms is FALSE?
A	The data must be sorted.
B	There must be a mechanism to access elements in the middle of the data structure.
C	Binary search is inefficient when performed on a linked list.
D	Binary search can be implemented to take $\Theta(n)$ time in the worst case.
Explanation	Binary search takes $\Theta(\log n)$ time, worst case.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-ExplainCode, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicWG-LinkedLists, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Searching-Binary, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, Contributor_Andrew_Luxton-Reilly

Field	Value
ID	634975 [created: 2013-06-22 07:49:29, author: jspacco (xjaime), avg difficulty: 2.0000]
Question	Suppose you are using a library implementation of a LinkedList. You have only the compiled binary version of the code, but not the source code. You want to know if the runtime complexity of the size() method is $O(1)$. (i.e. you want to know if the library stores the size, or if it counts each node every time size() is invoked). Which approach(es) would tell you if the size() method is $O(1)$?
A	Insert one element and time how long the size method takes; compare this to how long the size method takes if you had inserted 100 elements. $O(1)$ means they should be about equal.
B	Insert a million elements and time how long the size method takes; compare this to how long the size method takes if you had inserted 10 million elements. $O(1)$ means they should be about equal.
C	Insert 10 billion elements and time how long the size method takes; compare this to how long the size method takes if you had inserted 100 billion elements. $O(1)$ means they should be about equal.
D	B and C both work
E	All 3 will work
Explanation	A won't work because most of what you are timing is the JVM starting up and shutting down. In fact, just checking the time elapsed may require as many machine instructions as checking the size of a linked list of size 1. C is also unlikely to work. Suppose each element is a single int, which is 4 bytes (this is a lower-bound on things you can put in a collection). A billion elements is 4 billion bytes. A gigabyte is a little more than a billion bytes, so this likely fills most of your RAM (about 4GB for many laptops and desktops in 2013). 10 billion elements is about 37 GB, which will fill the memory of all but the biggest machines available. You will be timing the garbage collector and memory allocator algorithms, not the size() method.
Tags	Contributor_Jaime_Spacco, ATT-Transition-CSspeak_to_English, SkillIWG-AnalyzeCode, ATT-Type-Why, Difficulty-3-High, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-4-Macro-Structure, TopicWG-LinkedLists, Bloom-6-Evaluation, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, TopicWG-Runtime-StorageManagement, CodeLength-NotApplicable, ConceptualComplexity-3-High, Nested-Block-Depth-0-no_ifs_loops

Field	Value
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ID	633287 [created: 2013-06-21 09:30:56, author: jspacco (xjaime), avg difficulty: 0.5000]
Question	What is returned by <code>'A' < 'A LinkLetter'</code> ?
A	True
B	False
C	'A'
D	an error
E	none of the above
Explanation	This is a lexicographic (i.e. alphabetic) comparison, but the first String 'A' is a substring of the second String. We fall back on the "nothing before something" principle, and return True, because when sorting Strings, nothing comes before something. This is why the word 'a' comes before 'aardvark' in the dictionary, as well as why 'ant' comes before 'anteater' and 'the' comes before 'these' or 'then'.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633252 [created: 2013-06-18 07:28:42, author: crjirc (xchris), avg difficulty: 1.0000]
Question	Growing the array used to implement a heap so that it may hold more elements is
A	$O(1)$
B	$O(\log N)$
C	$O(N)$
D	$O(N \log N)$
E	$O(N^2)$
Explanation	The order of elements in the array doesn't change any. They only need to be copied over in their original sequence, making this an $O(N)$ operation.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630935 [created: 2013-06-13 11:48:32, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you are writing software for a helpdesk. Each request is entered into the system as it arrives. Which of the following abstract datatypes would be the best choice to store these requests? Be prepared to justify your answer.
A	A Stack
B	A Queue
C	An OrderedList
D	A PriorityQueue
E	A Dictionary
Explanation	B and D are the two best choices. B allows you to handle the requests in the order received; D allows you the flexibility to override that order when needed, by giving certain requests a higher priority. E is less good because although you could let a priority be the index into the Dictionary, Dictionaries aren't guaranteed to return items of the same priority in the order they were added to the Dictionary. A is wrong, because it would guarantee that the most recent requests are always handled first. An argument could be made for C -- elements could be added to the list in order of priority, following any other elements with the same priority. The needed operations will likely be less efficient than they would be with a Queue or PriorityQueue, however.

Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-5-Synthesis, Language-none-none-none, CS2, LinguisticComplexity-2-Medium, MultipleAnswers-AAA-WWWWWWWWWWWWW, CodeLength-NotApplicable, TopicSimon-ProgramDesign, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	631885 [created: 2013-06-17 08:33:17, author: kate (xkate), avg difficulty: 1.0000]
Question	<p>After the assignment statement</p> <pre>String word = "entropy";</pre> <p>what is returned by</p> <pre>word.substring(2, 4);</pre>
A	"ntro"
B	"nt"
C	"trop"
D	"tr"
E	an error
Explanation	The Java <code>String</code> method <code>word.substring (2, 4)</code> returns the substring of <code>word</code> starting at the third character (array index 2) and ending with the fourth character (array index 4-1).
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CSOther, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	633567 [created: 2013-06-19 14:30:38, author: crjjrc (xchris), avg difficulty: 1.0000]
Question	You must store a large amount of data, and both searching and inserting new elements must be as fast as possible. What's the simplest data structure that meets your needs?
A	Ordered array
B	Linked list
C	Hashtable
D	Binary search tree
E	Self-balancing tree
Explanation	Hashtables provide O(1) insertion and searching, provided collisions aren't too numerous.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632103 [created: 2013-06-17 20:41:33, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	Which data structure does java use when evaluates a mathematical expression in a program?
A	A tree
B	A binary tree
C	A linked list
D	An array

Field	Value
ID	633636 [created: 2013-06-22 09:11:30, author: jspacco (xjaime), avg difficulty: 2.0000]
Question	Suppose we have a Queue implemented with a circular array. The <code>capacity</code> is 10 and the <code>size</code> is 5. Which are <i>not</i> legal values for <code>front</code> and <code>rear</code> ?
A	front: 0 rear: 5
B	front: 5 rear: 9
C	front: 7 rear: 2
D	front: 9 rear: 4
E	all of the above
Explanation	There would only be 4 items in this queue, not 5. This is easier to illustrate with a picture. But you can sort of see the pattern by looking at the absolute value of the difference between all of the pairings. B is the only one that differs by 4; the others all differ by 5.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, TopicWG-ADT-Queue-Implementations, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633564 [created: 2013-06-19 14:19:42, author: crjirc (xchris), avg difficulty: 1.0000]
Question	You know exactly how much data you need to store, but there's not much of it. You do need to be able to search the collection quickly. What is the simplest data structure that best suits your needs?
A	Unordered array
B	Ordered array
C	Linked list
D	Hashtable
E	Binary search tree
Explanation	The memory needs are known, making an array a fine choice. Sorted arrays can be searched quickly with binary search.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618650 [created: 2013-05-28 21:14:33, author: marzieh (xmarzieh), avg difficulty: 1.0000]
Question	What would be the output? <pre>public class test { static int testCount; public test(){ testCount ++; } public static void main(String [] Args){ test t1 = new test(); System.out.println(t1.testCount); } }</pre>

	<pre> test t2 = new test(); System.out.println(t1.testCount + " " + t2.testCount); test t3 = new test(); System.out.println(t1.testCount+ " " + t2.testCount+ " " + t3.testCount); } } </pre>
A	<pre> 0 0 0 0 0 0 </pre>
B	<pre> 1 1 1 1 1 1 </pre>
C	<pre> 1 2 2 3 3 3 </pre>
D	This is an error. testCount has never been initialized.

Field	Value
ID	632113 [created: 2013-06-14 00:33:53, author: tclear (xtony), avg difficulty: 1.0000]
Question	I have a data control, dtData, and several text boxes which are bound to it. The program user edits some of the text in one of the boxes, but makes a mistake and presses the Cancel button to undo the changes. What code should the Cancel button invoke?
A	dtData.Recordset.Update
B	dtData.Recordset.Delete
C	dtData.UpdateControls
D	dtData.UpdateRecord
E	dtData.Clear
Explanation	This method applies the cancel event procedure to restore the display content of the text boxes associated with the Data control without affecting the underlying recordset.
Tags	Skill-ExplainCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Vertical-2-Block, Bloom-2-Comprehension, TopicSimon-FileIO, TopicSimon-GUI-Design-Implementat, Language-VB, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	618495 [created: 2013-05-28 19:49:03, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>How many active object references and reachable objects will be produced by this code?</p> <pre> String first = new String("Dorsa"); String second = new String("Mahsa"); String third = second; second = null; </pre>
A	2 , 2
B	3, 2
C	3, 3
D	2, 3

Field	Value
ID	635020 [created: 2013-05-21 14:33:56, author: mikeyg (xmikey), avg difficulty: 2.0000]
Question	Programs implementing the "Examine All" programming pattern typically run in time:
A	$O(n^2)$
B	$O(n^3)$
C	$O(n)$
D	$O(n!)$
E	$O(n \log_2 n)$
Explanation	Examine all algorithm need, in the worst case, to individually "process" each element or value in the input once. Hence examine all algorithms exhibit a linear run time. Examples of examine all algorithms include <i>Find Largest</i> , <i>Count Odd</i> , or, <i>Is Sorted</i> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-Why, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable

Field	Value
ID	633281 [created: 2013-06-21 09:24:05, author: jspacco (xjaime), avg difficulty: 1.0000]
Question	Which of the following are <i>not</i> legal Java identifiers?
A	fiveGuys
B	5Guys
C	five_guys
D	numGuys5
E	five guys
Explanation	E is also illegal.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	618971 [created: 2013-05-29 04:49:17, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	Which of the following choices will NOT produce the same result as the following condition? <pre> if (mark == 'A' && GPA > 3.5) System.out.println("First Class"); else if (mark == 'A' && GPA <= 3.5) System.out.println("Second Class"); else if (mark != 'A' && GPA > 3.5) System.out.println("Third Class"); else if (mark != 'A' && GPA <= 3.5) System.out.println("Fourth Class"); </pre>
A	<pre> if (mark != 'A' GPA < 3.5) System.out.println("First Class"); else if (mark != 'A' GPA >= 3.5) System.out.println("Second Class"); else if (mark == 'A' GPA < 3.5) System.out.println("Third Class"); </pre>

	<pre> else if (mark == 'A' GPA >= 3.5) System.out.println("Fourth Class"); </pre>
B	<pre> if (mark != 'A') if (GPA > 3.5) System.out.println("Third Class"); else System.out.println("Fourth Class"); else if (GPA > 3.5) System.out.println("First Class"); else System.out.println("Second Class"); </pre>
C	<pre> if (GPA > 3.5) if (mark == 'A') System.out.println("First Class"); else System.out.println("Third Class"); else if (mark == 'A') System.out.println("Second Class"); else System.out.println("Fourth Class"); </pre>
D	<pre> if (mark == 'A') if (GPA > 3.5) System.out.println("First Class"); else System.out.println("Second Class"); else if (GPA > 3.5) System.out.println("Third Class"); else System.out.println("Fourth Class"); </pre>

Field	Value
ID	634199 [created: 2013-06-24 15:22:47, author: patitsas (xelizabeth), avg difficulty: 1.0000]
Question	<p>Chengcheng has an array that he would like to sort, and implements the following sorting method in C. Which sorting algorithm is this? (code is adapted from http://en.wikibooks.org/wiki/Algorithm_implementation)</p> <pre> void sort_array(int a[], int length) { // sorts the array a[], of length "length" int i, j, value; for(i = 1; i < length; i++) { value = a[i]; for (j = i - 1; j >= 0 && a[j] > value; j--) { a[j + 1] = a[j]; } a[j + 1] = value; } } </pre>
A	Insertion Sort

B	Selection Sort
C	Bubble sort
D	Mergesort
Explanation	The code is working from one end of the array to the other, sorting as it goes.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Language-C, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicWG-Sorting-Quadratic

Field	Value
ID	618519 [created: 2013-05-28 20:02:59, author: marzieh (xmarzieh), avg difficulty: 2.0000]
Question	Which definition is not allowed? <pre>firstLevel first = new firstLevel(); secondLevel second = new secondLevel(); firstLevel third = new secondLevel(); secondLevel fourth = new firstLevel();</pre>
A	first
B	second
C	third
D	fourth

Field	Value
ID	633889 [created: 2013-06-23 12:53:06, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	William has the hash function: hash function $h(k) = (\text{sum of the digits}) \% 10$. He wants to hash 33, 60, 24, 42 and 6. Which collision resolution method should he chose in his implementation, if he wants to ensure that adding 80 happens in $O(1)$ time?
A	Quadratic probing
B	Linear probing
C	Rth probing, $R = 2$
Explanation	Both Rth probing ($R=2$) and linear probing will hash values to the 8 position -- only quadratic probing will leave that position open.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, CS2, CodeLength-NotApplicable

Field	Value
ID	634130 [created: 2013-06-24 08:03:00, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Yuchi and Rui are working on a problem: to create an array whose elements are the sum of the row and column indices. (For example, $\text{arr}[2][3] = 5$, as does $\text{arr}[3][2]$.) They're both working off the same server using the same compiler settings. <pre>// Yuchi's Code #define N 500 ---- (other code skipped) ---- int arr[N][N]; int i; int j; for(i = 0; i < N; i++) { for(j = 0; j < N; j++) { arr[i][j] = i + j; } }</pre>

```
// Rui's Code
#define N 500
---- (other code skipped) ----
int arr[N][N]; int i; int j;
for(i = 0; i < N; i++)
{
    for(j = 0; j < N; j++)
    {
        arr[j][i] = i + j;
    }
}
```

Whose code will be faster?

A Yuchi's code

B Rui's code

C The two are identical

Explanation Yuchi's code will be slightly faster as C uses row-major order array storage.

Tags Nested-Block-Depth-2-two-nested, Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, SkillWG-AnalyzeCode, ATT-Type-Why, Difficulty-3-High, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Language-C, Bloom-3-Analysis, CS2, LinguisticComplexity-2-Medium, TopicWG-Runtime-StorageManagement, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium

Field	Value
ID	635013 [created: 2013-06-29 23:01:29, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The following method, called maxRow(), is intended to take one parameter: a List where the elements are Lists of Integer objects. You can think of this parameter as a matrix—a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 5 so that this method works as intended:</p> <pre>public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 }</pre>
A	<code>matrix.size()</code>
B	<code>matrix[row].size()</code>
C	<code>matrix.get(row).size()</code>
D	<code>matrix.get(col).size()</code>
E	<code>matrix.get(row).get(col)</code>
Explanation	The blank on line 5 controls the upper limit of the <code>col</code> counter. It should represent the total number of columns in the current row, which can be retrieved with the expression <code>matrix.get(row).size()</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	635042 [created: 2013-06-17 12:11:27, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	The <i>scope</i> of a variable in Java is:
A	The thing that allows it to see other variables;
B	The other variables that it can interact with
C	The part of the program in which it can be used
D	One of its instance variables
E	None of the above
Explanation	The scope of a variable is the part of the program in which that variable can be referred to by its name. A private instance variable in a class definition, for example, can only be referred to within that class definition.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-1-Low, Language-none-none-none, CS1, CodeLength-NotApplicable, TopicSimon-Scope-Visibility

Field	Value
ID	633894 [created: 2013-06-23 12:39:27, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What does a binary tree not have in common with a doubly-linked list?
A	A node's definition has (at least) two pointers defined
B	If a node A points to a node B, then B will point to A
C	A given node will be pointed to at most one other node
Explanation	Only the binary tree is hierarchical; only the linked list will have symmetric pointers.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, TopicWG-ADT-List-Implementations, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Language-C, Language-Cplusplus, TopicWG-LinkedLists, Bloom-2-Comprehension, CS2, LinguisticComplexity-2-Medium, TopicWG-Pointers-ButNotReferences, CodeLength-NotApplicable, TopicWG-Trees-Other

Field	Value
ID	635012 [created: 2013-06-26 03:49:23, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>After the following syntactically correct code is executed, where will Karel be standing and which direction will the robot be facing? How many beepers will karel be carrying? There are beepers at (2,2), (2,3), (2,4), (2,5), (2,6). (Note: a beeper at (2,5) means there is a beeper at the intersection of 2nd street and 5th avenue.)</p> <pre> def task (): karel = Robot (2,2,East,0); while (karel.nextToABeeper()): karel.turnLeft() karel.move() for i in range (2): karel.turnLeft() karel.move() karel.turnLeft() if (karel.nextToABeeper()): karel.pickBeeper() karel.move() karel.move() karel.turnOff() </pre>
A	Robot is facing East with five beepers and is located at (2,8)
B	Robot is facing East with five beepers and is located at (2,7)
C	Robot is facing North with five beepers and is located at (8,2)
D	Robot is facing East with one beeper and is located at (2,2)

E	Robot is facing North with one beeper and is located at (2,2)
Explanation	There is a final "move" after the loop terminates, moving the robot over one block east (from (2,7) to (2,8)).
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	635026 [created: 2013-06-17 17:30:15, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> public BallPanel extends javax.swing.JPanel { private Ball[] _balls; public BallPanel(){ _balls = new Ball[20]; for (int i=0; i<10; i++) _balls[i] = new Ball(); } ... } </pre> <p>After I have instantiated a <code>BallPanel</code> using the above code, which of the following Java statements would work (if executed in some method of <code>BallPanel</code>)? Assume <code>Ball</code> has a public <code>getColor()</code> method.</p>
A	<code>_balls[20] = new Ball();</code>
B	<code>_balls[0] = _balls[15];</code>
C	<code>_balls[10].getColor();</code>
D	Both A and C work
E	Both B and C work
Explanation	<p>A doesn't work, since the possible range of a 20 element array index is 0 to 19 inclusive.</p> <p>B works, even though <code>_balls[15]</code> was never assigned a value -- its value is set to <code>null</code> when the array is instantiated, and B would set <code>_balls[0]</code> to <code>null</code></p> <p>C doesn't work: since only <code>_balls[0]</code> to <code>_balls[9]</code> were assigned values, <code>_balls[10]</code>'s value is <code>null</code>, and we cannot call methods on a null instance.</p> <p>So the answer is B.</p>
Tags	ATT-Transition-ApplyCode, Skill-DebugCode, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-2-Medium, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, Bloom-2-Comprehension, CS1, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	635016 [created: 2013-06-25 15:21:39, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Which of the following is an equivalent boolean expression for:</p> <p>NOT(A AND B)</p>
A	(NOT A) AND (NOT B)
B	A OR B
C	(NOT A) AND B
D	(NOT A) OR (NOT B)
E	NOT(A OR B)
Explanation	When applying DeMorgan's law, one distributes the NOT over both operands and then one exchanges AND 's for OR 's, or OR 's for AND 's
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-none-none-none, TopicSimon-LogicalOperators, CS1, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635021 [created: 2013-06-29 23:06:24, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The following method, called maxRow(), is intended to take one parameter: a List where the elements are Lists of Integer objects. You can think of this parameter as a matrix—a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 6 so that this method works as intended:</p> <pre> public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 } </pre>
A	<code>maxSum</code>
B	<code>matrix[row][col]</code>
C	<code>matrix.get(row).get(col)</code>
D	<code>matrix.get(col).size()</code>
E	<code>maxVec</code>
Explanation	The loop on Line 5 incrementally accumulates the sum of all entries in the current row, which is held in the local variable <code>sum</code> . The purpose of Line 6 is to add the current column value to this running sum. The value of the current cell in the matrix is <code>matrix.get(row).get(col)</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	635040 [created: 2013-06-17 12:18:18, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	The <i>lifetime</i> of a parameter in Java is
A	Really long
B	From when its method is called until it returns
C	From when you define the method until you quit out of Eclipse
D	As long as the program is running
E	None of the above
Explanation	The lifetime of a variable is the duration over which it keeps a value unless you change it. With a parameter, its value is set when you invoke the method, and it retains that value (or what every you subsequently set it to) until you return.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-1-Low, Language-Java, Bloom-3-Analysis, TopicSimon-Lifetime, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicSimon-Params-SubsumesMethods

Field	Value
ID	633888 [created: 2013-06-23 12:56:18, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Rohan has the code <code>int len = strlen("Rohan")</code> . What is the value of <code>len</code> ?

A	0
B	5
C	6
D	8
Explanation	While the \0 will be added to the end of the array, it is not included in the length calculation.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635023 [created: 2013-06-17 17:47:49, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<p>Suppose <code>s</code> is an instance of a stack that can store Strings, and I execute the following statements?</p> <pre> 1. s.push("Finland"); 2. s.push("is"); 3. s.push("my"); 4. String w = s.peek(); 5. String x = s.pop(); 6. s.push("home"); 7. String y = s.pop(); 8. String z = s.pop(); </pre> <p>What is the value of z after executing these statements in order?</p>
A	"Finland"
B	"is"
C	"my"
D	"home"
E	None of the above
Explanation	<p>After the three pushes the stack contents (from top) is ["my" "is" "Finland" ...]</p> <p>4. doesn't change the stack.</p> <p>the contents of the stack are (after each numbered instruction)</p> <p>5. ["is" "Finland" ...]</p> <p>6. ["home" "is" "Finland" ...]</p> <p>7. ["is" "Finland" ...]</p> <p>8. sets z to "is", which is popped, leaving the stack as ["Finland" ...]</p> <p>So B is correct.</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-1-Low, TopicWG-ADT-Stack-DefInterfaceUse, Language-Java, CS2, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	635038 [created: 2013-06-17 16:18:21, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> public class Outer extends SomeClass implements SomeInterface{ ... private class Inner extends AnotherClass { ??? } } </pre> <p>Suppose I define an inner class, as is abstractly illustrated by the code above. Assuming that I do not shadow anything (by declaring or defining something in the</p>

	inner class with the same name as something accessible in the outer class), what in the outer class is accessible to the code in the inner class (at ????, e.g.) ?
A	All protected methods and protected instance variables of the outer class
B	All public methods and public instance variables of the outer class
C	All methods and all public instance variables of the outer class
D	All methods and instance variables of the outer class.
E	None of the above is true
Explanation	The inner class is within the scope of the outer class, which means that all instance variables and public methods (including methods inherited from the outer class's ancestors). are accessible from the inner class. Shadowing is a problem, since there is no automatic way to refer to the instance of the outer class.
Tags	ATT-Transition-ApplyCode, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-2-Medium, Language-Java, CS1, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-1

Field	Value
ID	635036 [created: 2013-06-17 16:55:30, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public BallPanel extends javax.swing.Panel { 2. private Ball[] _balls; 3. public BallPanel(int numberOfBalls){ 4. _balls = new Ball[numberOfBalls]; 5. for (int i=0;i<_balls.length;i++) 6. _balls[i] = new Ball(); 7. } 8. } </pre> <p>In the above Java code, what is the value of <code>_balls.length</code> immediately after lines 4 and 6 (respectively)?</p>
A	<code>0, numberOfBalls</code>
B	<code>numberOfBalls, numberOfBalls</code>
C	<code>i, numberOfBalls</code>
D	<code>0, numberOfBalls - 1</code>
E	<code>_balls.length</code> is undefined
Explanation	When the array is instantiated in line 4, its length is set (to numberOfBalls). Lines 5 and 6 set the values of the array elements, but do not change the length of the array.
Tags	ATT-Transition-ApplyCode, Skill-ExplainCode, Contributor_Robert_McCartney, Difficulty-1-Low, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	635031 [created: 2013-06-17 17:12:30, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. import java.util.ArrayList; 2. public BallPanel extends javax.swing.JPanel { 3. private ArrayList <Ball> _moreBalls; 4. public BallPanel(int numberOfBalls){ 5. _moreBalls = new ArrayList<Ball>(); 6. for (int i=0;i<numberOfBalls;i++) 7. _moreBalls.add(new Ball()); 8. } 9. } </pre> <p>What is the value of <code>_moreBalls.size()</code> immediately after lines 4 and 6 (respectively) if we invoke the BallPanel constructor?</p>
A	<code>0, numberOfBalls</code>
B	<code>numberOfBalls, numberOfBalls</code>
C	<code>i, numberOfBalls</code>

D	<code>0, numberOfBalls - 1</code>
E	<code>_moreBalls.size()</code> is undefined
Explanation	A is correct. When you instantiate an ArrayList (in line 4) its size (the number of elements in the ArrayList) is zero because you haven't added any elements; lines 5 and 6 add numberOfBalls elements to the ArrayList, so after that the size is numberOfBalls.
Tags	ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, Skill-PureKnowledgeRecall, ATT-Type-How, TopicSimon-CollectionsExceptArray, Language-Java, CS1, LinguisticComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	635022 [created: 2013-06-17 17:54:35, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<p>Suppose <code>s</code> is an instance of a stack that can store Strings, and I execute the following statements starting with <code>s</code> empty:</p> <pre> 1. s.push("Iceland"); 2. s.push("is"); 3. String w = s.peek(); 4. String x = s.pop(); 5. s.push("cool"); 6. String y = s.pop(); 7. boolean z = s.isEmpty(); </pre> <p>What is the value of z after executing this sequence of expressions?</p>
A	<code>"Iceland"</code>
B	<code>"cool"</code>
C	<code>true</code>
D	<code>false</code>
E	None of the above
Explanation	In the sequence of operations, we pushed 3 things onto the stack, and only popped 2 off (and at no point had we popped more times than we pushed). So the stack is not empty.
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, TopicWG-ADT-Stack-DefInterfaceUse, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium

Field	Value
ID	635018 [created: 2013-06-29 21:59:37, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Kun has a method:</p> <pre> struct node{ struct node *next; int val; } </pre> <pre> void delete_root(struct node *root) { free(root); root = NULL; } </pre> <p>What is most likely to happen?</p>
A	Deletes a copy of root
B	Deletes root
C	Segfault
D	A lot of crazy stuff will be printed

Explanation	The code frees memory it shouldn't be, and will do a core dump.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-Lifetime, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	635043 [created: 2013-06-17 11:54:23, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	One of the key features of Object-oriented programming is encapsulation. Because of encapsulation, we generally have _____ instance variables and _____ methods.
A	protected, private
B	private, public
C	public, private
D	public, public
E	These have nothing to do with encapsulation.
Explanation	Encapsulation involves hiding the internal state of an object, in particular not allowing direct access to an object's instance variables. We use methods to define the interactions other objects can have with an object, so the internal structure and information is not revealed to the outside.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Robert_McCartney, Skill-PureKnowledgeRecall, Difficulty-1-Low, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, CodeLength-NotApplicable, TopicSimon-Params-SubsumesMethods

Field	Value
ID	633877 [created: 2013-06-23 12:42:24, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Amr wants to use quicksort to sort the series [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17]. What choice of pivot will yield the least efficient code?
A	The first element of a sublist
B	The middle element of a sublist
C	A random element of a sublist
Explanation	For a ascending sorted list, quicksort partitioning on the smallest element will be $O(n^2)$.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN, TopicWG-Sorting-Other, TopicWG-Sorting-Quadratic

Field	Value																
ID	635121 [created: 2013-06-30 21:03:14, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have an array of seven <code>int</code> values called <code>test</code> containing the following data:</p> <table><tr><td><i>index</i></td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td><i>test</i></td><td>8</td><td>6</td><td>0</td><td>3</td><td>4</td><td>9</td><td>2</td></tr></table> <p>Trace the execution of the following code:</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.length; i++) { if (test[i] % 2 == 1) { y += test[i]; } else { x += test[i]; } }</pre>	<i>index</i>	0	1	2	3	4	5	6	<i>test</i>	8	6	0	3	4	9	2
<i>index</i>	0	1	2	3	4	5	6										
<i>test</i>	8	6	0	3	4	9	2										

	<div><div>}</div></div>
	What is the value of <input type="text" value="x"/> when this loop is done?
A	2
B	5
C	12
D	20
E	32
Explanation	The loop traverses the array from left to right, and the if statement determines whether the corresponding value is odd or even. The local variable <input type="text" value="x"/> is used to accumulate the sum of the even numbers in the array, so <input type="text" value="x"/> = 8 + 6 + 0 + 4 + 2 = 20.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value																
ID	635123 [created: 2013-06-30 21:24:06, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have an array of seven <code>int</code> values called <code>test</code> containing the following data:</p> <table><tr><td><i>index</i></td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td><i>test</i></td><td>8</td><td>14</td><td>0</td><td>12</td><td>10</td><td>9</td><td>20</td></tr></table> <p>Trace the execution of the following code:</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.length; i++) { if (test[i] % 4 == 0) { x++; y += test[i]; } }</pre> <p>What is the value of <code>x</code> when this loop is done?</p>	<i>index</i>	0	1	2	3	4	5	6	<i>test</i>	8	14	0	12	10	9	20
<i>index</i>	0	1	2	3	4	5	6										
<i>test</i>	8	14	0	12	10	9	20										
A	3																
B	4																
C	7																
D	35																
E	40																
Explanation	The loop traverses the array from left to right, and the if statement determines whether the corresponding value is evenly divisible by 4. The local variable <code>x</code> is used to count the number of values found, so <code>x</code> is 4.																
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps																

Field	Value
ID	635124 [created: 2013-06-30 21:29:26, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]

Question Suppose you have an array of seven `int` values called `test` containing the following data:

<i>index</i>	0	1	2	3	4	5	6
<i>test</i>	8	14	0	12	10	9	20

Trace the execution of the following code:

```
int x = 0;
int y = 0;
for (int i = 0; i < test.length; i++)
{
    if (test[i] % 4 == 0)
    {
        x++;
        y += test[i];
    }
}
```

What is the value of `x` when this loop is done?

- A 3
- B 4
- C 7
- D 35
- *E* 40

Explanation The loop traverses the array from left to right, and the if statement determines whether the corresponding value is evenly divisible by 4. The local variable y is used to accumulate the sum of the numbers found, so $y = 8 + 0 + 12 + 20 = 40$.

Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps

Field	Value																
ID	635125 [created: 2013-06-30 21:13:27, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have an array of seven <code>int</code> values called <code>test</code> containing the following data:</p> <table><tr><th><i>index</i></th><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><th><i>test</i></th><td>8</td><td>6</td><td>0</td><td>3</td><td>4</td><td>9</td><td>2</td></tr></table> <p>Trace the execution of the following code:</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.length; i++) { if (test[i] % 2 == 1) { y += test[i]; } else { x += test[i]; } }</pre> <p>What is the value of <code>y</code> when this loop is done?</p>	<i>index</i>	0	1	2	3	4	5	6	<i>test</i>	8	6	0	3	4	9	2
<i>index</i>	0	1	2	3	4	5	6										
<i>test</i>	8	6	0	3	4	9	2										
A	2																
B	5																

C	12
D	20
E	32
Explanation	The loop traverses the array from left to right, and the if statement determines whether the corresponding value is odd or even. The local variable <code>y</code> is used to accumulate the sum of the odd numbers in the array, so $y = 3 + 9 = 12$.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635126 [created: 2013-06-30 21:54:24, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Assume that an object of the following class has just been created:</p> <pre> public class Unknown { private int x; public Unknown() { x = 17; method1(); method2(5); method3(); System.out.println(x); // Line D } public void method1() { --x; int x = this.x; x++; System.out.println(this.x); // Line A } public void method2(int x) { x++; System.out.println(x); // Line B } public void method3() { --x; int x = 2; x++; System.out.println(x); // Line C } } </pre> <p>What output is produced by Line A when an instance of this class is created?</p>
A	2
B	3
C	16
D	17
E	18
Explanation	Line A prints the value of the field called <code>x</code> . That field is initialized to 17 in the constructor, and then decremented on the first line of <code>method1()</code> , so the value printed is 16. The increment operation in <code>method1()</code> applies to the local variable within the method, not the field that happens to have the same name.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-

1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633644 [created: 2013-06-22 09:27:39, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>True or False:</p> <p>You should <i>always</i> catch checked exceptions!</p>
A	True
B	False
Explanation	<p>This is definitely False! Consider this code:</p> <pre>String s=""; try { BufferedReader r=new BufferedReader(new FileReader("foo.txt")); // read file and concatenate onto s } catch (IOException e) { System.out.println("Can't read file"); }</pre> <p>Why are we catching this exception? We are not doing anything useful with it. What happens when there is an exception? The program prints an error, but continues with an empty String s. That's probably wrong and it makes like the file contained an empty String, which may be an illegal input. What if this code is being use by a web service and there is not someone monitoring the printing. What if it's running where System.out is not being captured?</p> <p>It would be better if this code just crashed.</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-4-Macro-Structure, Language-Csharp, Language-Java, TopicSimon-ExceptionHandling, Bloom-6-Evaluation, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633642 [created: 2013-06-22 09:20:18, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following method:</p> <pre>public int size() { XXXXXX }</pre> <p>Which of the following could replace the XXXXX and be the body of the <code>size()</code> method for a Queue that uses a circular array implementation?</p>
A	<pre>if (front==rear) return 0; return rear-front;</pre>
B	<pre>if (rear>front) return rear-front; return front-rear;</pre>
C	<pre>if (front==0 && front==rear) return 0; if (front>rear) return front-rear; return rear-front;</pre>
D	<pre>if (front>rear) return front-rear; if (front==rear) return 0; return rear-front;</pre>

E	<pre> if (front==rear) return 0; if (front>rear) return front-rear; if (rear>front) return rear-front; </pre>
Explanation	<p>B, C, D all work.</p> <p>E would be correct, but it won't compile since it doesn't return a value on <i>all</i> paths.</p>
Tags	Contributor_Jaime_Spacco, ATT-Transition-CSspeak_to_Code, TopicWG-ADT-Queue-Implementations, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, MultipleAnswers-See-Explanation, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	635127 [created: 2013-06-30 21:59:36, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Assume that an object of the following class has just been created:</p> <pre> public class Unknown { private int x; public Unknown() { x = 17; method1(); method2(5); method3(); System.out.println(x); // Line D } public void method1() { --x; int x = this.x; x++; System.out.println(this.x); // Line A } public void method2(int x) { x++; System.out.println(x); // Line B } public void method3() { --x; int x = 2; x++; System.out.println(x); // Line C } } </pre> <p>What output is produced by Line B when an instance of this class is created?</p>
A	3
B	5
C	6
D	17
E	18
Explanation	Line B prints the value of the parameter called <code>x</code> in <code>method2()</code> . That parameter is given the value 5 when <code>method2()</code> is called from the constructor, and then the parameter itself is incremented on the first line of <code>method2()</code> , so the value printed is 6.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control,

ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633629 [created: 2013-06-22 07:55:36, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following implementation of a contains() method for a Queue in Java:</p> <pre> public class Queue<E> { private LinkedList<E> list; // Assume correct enqueue(), // dequeue(), size() methods public boolean contains(E e){ for (int i=0; i<list.size(); i++) { if (list.get(i).equals(e)) { return true; } } return false; } } </pre> <p>What is the runtime (big-Oh) complexity of this method?</p>
A	$O(1)$
B	$O(n)$
C	$O(n \cdot \log_2 n)$
D	$O(n^2)$
E	$O(2^n)$
Explanation	This is sort of a trick question. The get() method of a LinkedList is $O(n)$, and we are calling this method $O(n)$ times, so we have $O(n^2)$.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Jaime_Spacco, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, TopicWG-LinkedLists, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium

Field	Value
ID	635128 [created: 2013-06-30 22:05:56, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Assume that an object of the following class has just been created:</p> <pre> public class Unknown { private int x; public Unknown() { x = 17; method1(); method2(5); method3(); System.out.println(x); // Line D } public void method1() { --x; int x = this.x; x++; System.out.println(this.x); // Line A } public void method2(int x) { x++; } } </pre>

```

        System.out.println(x);        // Line B
    }

    public void method3()
    {
        --x;
        int x = 2;
        x++;
        System.out.println(x);        // Line C
    }
}

```

What output is produced by **Line C** when an instance of this class is created?

A 2

B 3

C 15

D 16

E 17

Explanation Line C prints the value of the local variable called `x` declared in `method3()`. That variable is initialized to 2 in its declaration, and then incremented on the following line of `method3()`, so the value printed is 3.

Tags ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value																
ID	635118 [created: 2013-06-30 20:56:04, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have a <code>List</code> of seven <code>Integer</code> values called <code>test</code> containing the following data:</p> <table><tr><th><i>index</i></th><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><th><i>test</i></th><td>18</td><td>6</td><td>0</td><td>3</td><td>36</td><td>9</td><td>24</td></tr></table> <p>Trace the execution of the following code (remember that Java will automatically convert between primitive <code>int</code> values and <code>Integer</code> wrapper objects where needed):</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.size(); i++) { if (test.get(i) % 6 == 0) { x++; y += i; } }</pre> <p>What is the value of <code>y</code> when this loop is done?</p>	<i>index</i>	0	1	2	3	4	5	6	<i>test</i>	18	6	0	3	36	9	24
<i>index</i>	0	1	2	3	4	5	6										
<i>test</i>	18	6	0	3	36	9	24										
A	5																
B	7																
C	13																
D	14																
E	84																
Explanation	The variable <code>y</code> is updated for each value in the array that is evenly divisible by 6--when <code>y</code> is updated, the <i>position</i> of the value (stored in <code>i</code>) is added to <code>y</code> , not the value itself. So the final value of <code>y</code> is $0 + 1 + 2 + 4 + 6 = 13$.																

Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps
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Field	Value																
ID	635117 [created: 2013-06-30 20:51:31, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have an array of seven <code>int</code> values called <code>test</code> containing the following data:</p> <table><tr><td>index</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>test</td><td>18</td><td>6</td><td>0</td><td>3</td><td>36</td><td>9</td><td>24</td></tr></table> <p>Trace the execution of the following code:</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.length; i++) { if (test[i] % 6 == 0) { x++; y += i; } }</pre> <p>What is the value of <code>y</code> when this loop is done?</p>	index	0	1	2	3	4	5	6	test	18	6	0	3	36	9	24
index	0	1	2	3	4	5	6										
test	18	6	0	3	36	9	24										
A	5																
B	7																
C	13																
D	14																
E	84																
Explanation	The variable <code>y</code> is updated for each value in the array that is evenly divisible by 6--when <code>y</code> is updated, the <i>position</i> of the value (stored in <code>i</code>) is added to <code>y</code> , not the value itself. So the final value of <code>y</code> is $0 + 1 + 2 + 4 + 6 = 13$.																
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps																

Field	Value																
ID	635115 [created: 2013-06-30 20:41:44, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have a <code>List</code> of seven <code>Integer</code> values called <code>test</code> containing the following data:</p> <table><tr><td><i>index</i></td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td><i>test</i></td><td>18</td><td>6</td><td>0</td><td>3</td><td>36</td><td>9</td><td>24</td></tr></table> <p>Trace the execution of the following code (remember that Java will automatically convert between primitive <code>int</code> values and <code>Integer</code> wrapper objects where needed):</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.size(); i++) { if (test.get(i) % 6 == 0) { x++; y += i; } }</pre>	<i>index</i>	0	1	2	3	4	5	6	<i>test</i>	18	6	0	3	36	9	24
<i>index</i>	0	1	2	3	4	5	6										
<i>test</i>	18	6	0	3	36	9	24										

	What is the value of <input type="text" value="x"/> when this loop is done?
A	0
B	3
C	4
D	5
E	7
Explanation	The variable <input type="text" value="x"/> is incremented for each value in the array that is evenly divisible by 6, so the final value of <input type="text" value="x"/> after the loop is 5.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635054 [created: 2013-06-26 05:52:02, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	Is a $O(n \log_2 n)$ algorithm ALWAYS preferable over an $O(n^2)$ algorithm?
A	False
B	True
Explanation	The correct answer is False, since one does not know the coefficients for the two algorithms, nor the specific value for n. (e.g. $.00001n^2$ vs $99999n \log_2 n$). Certainly, no matter what the coefficients are, when n is sufficiently large, the quadratic algorithm will eventually become less efficient.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635078 [created: 2013-06-30 10:46:53, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<pre>int a = 1; int d = 7; if (b > c) { a = 2; } else { d = a * 2; }</pre> <p>Which of the following code fragments is equivalent to the version above? "Equivalent" means that both fragments would assign the same values to <input type="text" value="a"/> and <input type="text" value="d"/>, given the same values for <input type="text" value="b"/> and <input type="text" value="c"/>.</p>
A	<pre>int a = 1; int d = 7; if (b < c) { d = a * 2; } else { a = 2; }</pre>
B	<pre>int a = 1; int d = 7; if (b <= c) {</pre>

	<pre> d = a * 2; } else { a = 2; } </pre>
C	<pre> int a = 1; int d = 7; if (b >= c) { a = 2; } else { d = a * 2; } </pre>
D	<pre> int a = 1; int d = 7; if (b > c) { d = a * 2; } else { a = 2; } </pre>
E	none are equivalent
Explanation	The opposite condition of <code>(b > c)</code> is <code>(b <= c)</code> . The correct answer has this opposite if test, and the two actions in the branches of the if statement in opposite positions.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-1

Field	Value
ID	633879 [created: 2013-06-23 12:45:30, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which command will tell gcc to optimize recursion so that any code that has been executed will not be executed again? (e.g. fibo(3) will only be calculated once.)
A	gcc fibonacci.c -O3
B	gcc fibonacci.c -o
C	gcc fibonacci.c --optimize
D	gcc fibonacci.c -g
Explanation	Optimization level 3 is what is needed to avoid redundant recursive calls.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633875 [created: 2013-06-23 12:31:37, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Malik is using quicksort. He has the list [3, 4, 5, 1, 0] and will be pivoting around the element 3. After partitioning, what will the list look like?
A	[3, 4, 5, 0, 1]
B	[1, 0, 3, 4, 5]
C	[3, 1, 0, 4, 5]

D	[0, 1, 3, 4, 5]
Explanation	In the implementation of quicksort we used in class, all elements before the pivot are moved before the pivot; all elements after the pivot are moved after it.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-2-Comprehension, Language-none-none-none, CS2, CodeLength-NotApplicable, TopicWG-Sorting-NlogN

Field	Value
ID	635079 [created: 2013-06-30 10:32:41, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>What output will the following code fragment produce?</p> <pre> public void fn() { int grade = 91; int level = -1; if (grade >= 90) if (level <= -2) System.out.println("A-level"); else System.out.println("B-status"); } </pre>
A	A-level
B	B-status
C	"A-level"
D	"B-status"
E	no output is produced
Explanation	Despite the indentation, no braces appear around the body of either if statement's branch(es). As a result, the else is associated with the second (inner) if. Since the outer if statement's condition is true, but the inner if statement's condition is false, the output is B-status .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	633676 [created: 2013-06-22 11:19:37, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Suppose you want to write a Python function that takes a list as a parameter and returns True if there are no instances of 3 immediately followed by a 4, and False otherwise.</p> <p>So this list returns True: [3 5 4]</p> <p>But this list returns false: [1 2 3 4 5].</p> <p>The following code has a bug in it. Which line contains the bug?</p> <pre> def no34(nums): for i in range(len(nums)): #line1 if nums[i]==3 and nums[i+1]==4: #line2 return False #line3 return True #line4 </pre>
A	line1
B	line2
C	line3
D	line4
Explanation	This will go over the edge of the list! Line1 should be: <pre>for i in range(len(nums)-1):</pre>
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-

Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low

Field	Value
ID	633673 [created: 2013-06-22 11:14:07, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Suppose you want to write a Python function that takes a list as a parameter and returns true if there are <i>no</i> instances of 3 immediately followed by a 4, and false otherwise. So this list returns True: [3 5 4] But this list returns false: [1 2 3 4 5].</p> <pre>def no34(nums): for i in range(len(nums)-1): if nums[i]==3 and nums[i+1]==4: return False #line1 else: return True #line2 return False #line3</pre> <p>What changes, if any, should be made to make this code correct</p>
A	No changes are necessary; it is correct as written
B	switch line1 and line2 (i.e return True for line1 and return False for line 2)
C	delete line2 (take the else statement with it)
D	switch line1 and line2 (i.e return True for line1 and return False for line 2) and delete line2 (take the else statement with it)
E	switch line2 and line3 (i.e return False for line2 and return True for line3)
Explanation	The else clause should be removed. If we don't see a 3-4, we can't conclude anything about the rest of the list.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Block-Horizontal-2-Struct_Control, TopicSimon-Arrays, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low

Field	Value
ID	635080 [created: 2013-06-30 10:59:08, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this code segment:</p> <pre>boolean x = false; boolean y = true; boolean z = true; System.out.println((!x y && !z));</pre> <p>What value is printed?</p>
A	true
B	false
C	nothing, there is a syntax error
Explanation	Since <input checked="" type="checkbox"/> x is false, <input checked="" type="checkbox"/> !x is true, forcing the entire expression to be true because of the <input type="checkbox"/> operator. Remember that <input checked="" type="checkbox"/> && has higher precedence than <input type="checkbox"/> for grouping.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635111 [created: 2013-06-30 20:06:06, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Determine if Java would evaluate the following boolean expression as true or false, or if there is something (syntactically) wrong with the expression:

	<code>(!x && !y) && (y && z)</code>
A	true
B	false
C	syntax error
Explanation	Consider the value of variable <code>y</code> , which appears in the expression twice. If <code>y</code> is false, the right subexpression must also be false, so the overall expression will be false, because of the semantics of <code>&&</code> . Alternatively, if <code>y</code> is true, the left subexpression must be false because of its inclusion of <code>!y</code> , which also causes the overall expression to be false.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635112 [created: 2013-06-30 19:59:56, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this code segment:</p> <pre>boolean x = false; boolean y = true; boolean z = true; System.out.println((x && !y z));</pre> <p>What value is printed?</p>
A	true
B	false
C	nothing, there is a syntax error
Explanation	Although <code>x</code> is false, and <code>!y</code> is also false, making <code>x && !y</code> evaluate to false, the variable <code>z</code> is true, so the overall expression is true because of the <code> </code> operator. Remember that <code> </code> has lower precedence than <code>&&</code> in boolean expressions.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value																
ID	635114 [created: 2013-06-30 20:37:35, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]																
Question	<p>Suppose you have an array of seven <code>int</code> values called <code>test</code> containing the following data:</p> <table><tr><th><i>index</i></th><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><th>test</th><td>18</td><td>6</td><td>0</td><td>3</td><td>36</td><td>9</td><td>24</td></tr></table> <p>Trace the execution of the following code:</p> <pre>int x = 0; int y = 0; for (int i = 0; i < test.length; i++) { if (test[i] % 6 == 0) { x++; y += i; } }</pre> <p>What is the value of <code>x</code> when this loop is done?</p>	<i>index</i>	0	1	2	3	4	5	6	test	18	6	0	3	36	9	24
<i>index</i>	0	1	2	3	4	5	6										
test	18	6	0	3	36	9	24										
A	0																
B	3																

C	4
D	5
E	7
Explanation	The variable <code>x</code> is incremented for each value in the array that is evenly divisible by 6, so the final value of <code>x</code> after the loop is 5.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	635129 [created: 2013-06-30 22:08:58, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Assume that an object of the following class has just been created:</p> <pre> public class Unknown { private int x; public Unknown() { x = 17; method1(); method2(5); method3(); System.out.println(x); // Line D } public void method1() { --x; int x = this.x; x++; System.out.println(this.x); // Line A } public void method2(int x) { x++; System.out.println(x); // Line B } public void method3() { --x; int x = 2; x++; System.out.println(x); // Line C } } </pre> <p>What output is produced by Line D when an instance of this class is created?</p>
A	2
B	3
C	15
D	16
E	17
Explanation	Line D prints the value of the field called <code>x</code> . That field is initialized to 17 in the constructor, and then decremented on the first line of <code>method1()</code> , and decremented again on the first line of <code>method3()</code> , so by the time execution reaches the <code>println()</code> method call at the end of the constructor, the value printed is 15.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control,

ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634421 [created: 2013-06-26 02:32:55, author: kate (xkate), avg difficulty: 0.0000]
Question	Dummy question: all block-model tags
A	blah
B	blah
C	blah
Explanation	This class has all the block-model tags checked and no others. It should produce a list of all block-model tags with the questions associated with each tag. (Note: the delimiter tags are included in case of errors).
Tags	Block-Horizontal-0-WWWWWWWWWWWWWWW, Block-Horizontal-1-Struct_Text, Block-Horizontal-2-Struct_Control, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-0-WWWWWWWWWWWWWWWWW, Block-Vertical-1-Atom, Block-Vertical-2-Block, Block-Vertical-3-Relations, Block-Vertical-4-Macro-Structure

Field	Value
ID	634949 [created: 2013-06-29 22:04:41, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the following partial and incomplete <code>SpellChecker</code> class that uses an <code>ArrayList</code> to hold a reference list of correctly-spelled words:</p> <pre> public class SpellChecker { private List<String> dictionary; // spelling storage. // Line 1 // assume a constructor exists that correctly instantiates and // populates the list (i.e. loads the dictionary for the spellchecker) public boolean spelledCorrectly(String word) // Line 2 { for (int counter = 0; counter < _____; counter++) // Line 3 { if (word.equals(_____)) // Line 4 { return true; // Line 5 } } return false; // Line 6 } public void addWord(String word) // Line 7 { if (_____) // check word is NOT already in the dictionary // Line 8 { _____; // add word at end of the dictionary // Line 9 } } // other SpellChecker class methods would follow } </pre> <p>Choose the best choice to fill in the blank on line 4 so that the code operates correctly.</p>
A	<code>dictionary.find(word)</code>
B	<code>dictionary[counter]</code>
C	<code>dictionary[word]</code>
D	<code>dictionary.get(counter)</code>
E	<code>dictionary.contains(word)</code>
Explanation	The loop in <code>spelledCorrectly()</code> checks each word in the list called <code>dictionary</code> for the specified word, using <code>counter</code> to traverse through all positions in the list. To retrieve a single word at the given position, use the expression <code>dictionary.get(counter)</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block,

Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	634950 [created: 2013-06-27 05:08:42, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>The following class definitions illustrates which important object-oriented programming concept?</p> <pre> class Animal: def __init__(self, name): # Constructor of the class self.name = name def talk(self): # Abstract method, defined by convention only raise NotImplementedError("Subclass must implement abstract method") class Cat(Animal): def talk(self): return 'Meow!' class Dog(Animal): def talk(self): return 'Woof! Woof!' </pre>
A	Polymorphism
B	Inheritance
C	Responsibility driven design
D	Tight/strong cohesion and loose coupling
E	None of the above.
Explanation	<p>This is the classic example of polymorphism. Consider the following code:</p> <pre> animals = [Cat('Missy'), Dog('Lassie')] for animal in animals: print(animal.name + ': ' + animal.talk()) # prints the following: # Missy: Meow! # Lassie: Woof! Woof! </pre>
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Vertical-3-Relations, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-2-Medium, TopicSimon-OOconcepts, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634953 [created: 2013-06-27 05:00:55, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	Which of the following is the best definition of an algorithm?
A	A well-ordered collection of unambiguous and effectively computable operations that when executed produces a result and halts in a reasonably short amount of time.
B	A well-ordered collection of unambiguous and effectively computable operations that when executed produces a result and halts in a finite amount of time.
C	A collection of unambiguous and effectively computable operations that when executed produces a result and halts in a finite amount of time.
D	A well-ordered collection of unambiguous and effectively computable operations that when executed produces a result.
E	A well-ordered collection of unambiguous and effectively computable operations.
Explanation	Option B provides the best definition. A key component is that in order to be an algorithm, it must eventually halt.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634170 [created: 2013-06-24 14:30:21, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Consider the code:</p> <pre>strcpy(str1, "abc");</pre> <pre>strcat(str1, "def");</pre> <p>What is the value of str1?</p>
A	abc
B	def
C	abcdef
D	defabc
Explanation	def is concatenated onto the end of abc
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634169 [created: 2013-06-24 14:27:03, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Gianluca wants to sort the array array, which has a length of length. He writes the following C code to do this. Which sorting algorithm has he implemented?</p> <pre>void sort_array(int *array, int length)</pre> <pre>{ int max, i, temp; while(length > 0) { max = 0; for(i = 1; i < length; i++) if(array[i] > array[max]) max = i; temp = array[length-1]; array[length-1] = array[max]; array[max] = temp; length--; } }</pre>
A	Insertion sort
B	Selection sort
C	Bubble sort
D	Mergesort
Explanation	Students should take note that this code is looking for the max elements over and over again.
Tags	Contributor_Elizabeth_Patitsas, Nested-Block-Depth-3-three-nested, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Language-C, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic, TopicSimon-SelectionSubsumesOps, ConceptualComplexity-3-High

Field	Value
ID	634954 [created: 2013-06-19 12:32:28, author: kate (xkate), avg difficulty: 0.0000]
Question	The worst-case time complexity of insertion sort is:
A	O(1)
B	O(n)

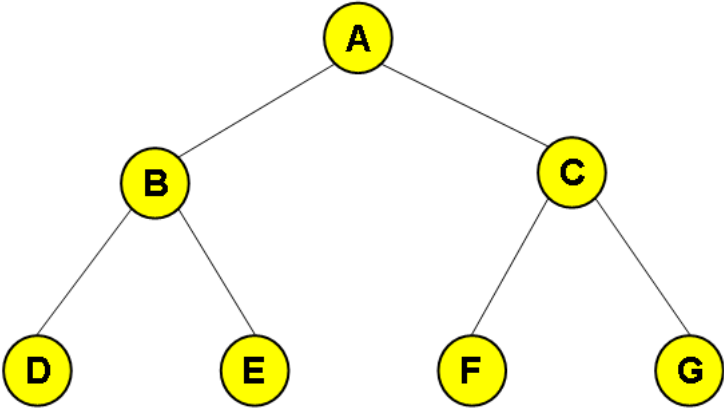
C	$O(n \log n)$
D	$O(n^2)$
E	none of the above
Explanation	Consider the case where the data are in reverse order. You will need to compare element 2 with element 1 and swap them; then compare element 3 with elements 1 and 2, shift elements 1 and 2 over, and insert element 3 in the first position, and so on. Each element will be compared with all of the elements before it, resulting in a total of $n(n-1)/2$ comparisons.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634957 [created: 2013-06-29 22:14:24, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Bryon has dynamically allocated memory for an array named arr using malloc. Once he's done using arr in his program, what single line of code should he write to free the block of memory that arr points to?
A	<code>free(arr);</code>
B	<code>free(*arr);</code>
C	<code>free(&arr);</code>
D	<code>dealloc(arr);</code>
E	<code>dealloc(*arr);</code>
Explanation	it's <code>free(arr)</code>
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, TopicSimon-Lifetime, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634155 [created: 2013-06-24 11:33:59, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Gisele has written a method, <code>tabulate</code> :</p> <pre>double tabulate(double (*fun)(double), double x) { return (*fun)(x); }</pre> <p>Write a single line of code that will call <code>tabulate</code> and return <code>sin(1.0)</code>.</p>
A	<code>tabulate(sin(1.0));</code>
B	<code>tabulate(sin, 1.0);</code>
C	<code>tabulate(sin(1.0), 1.0);</code>
Explanation	Only <code>sin</code> need be provided for the first parameter.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CS2, TopicWG-Pointers-ButNotReferences, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634961 [created: 2013-06-29 22:17:22, author: patitsas (xelizabeth), avg difficulty: 0.0000]

8/19/13	Canterbury QuestionBank
Question	<div>Which of the following makes an appropriate pre-condition for this code?<pre>double calculate_percentage(double sum, double n) { // calculates and returns a percentage given a sum and a length (n) // <missing pre-condition> // POST: none return (sum / n) * 100; }</pre></div>
A	PRE: sum < 100
B	PRE: n != 0
C	PRE: sum != NULL and n != NULL
D	PRE: none
Explanation	Want to avoid the divide by 0
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Language-C, TopicSimon-ExceptionHandling, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	634962 [created: 2013-06-19 15:45:34, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<div><pre>graph TD A((A)) --- B((B)) A --- C((C)) B --- D((D)) B --- E((E)) C --- F((F)) C --- G((G))</pre></div> <p>Given the above binary tree rooted at Node A, what is the order of nodes visited by a preorder search?</p>
A	A, B, C, D, E, F, G
B	A, B, D, E, C, F, G
C	D, B, E, A, F, C, G
D	D, E, B, F, G, C, A
E	G, F, E, D, C, B, A
Explanation	<p>A preorder search of a tree is: visit the root, visit the left subtree, visit the right subtree.</p> <p>It proceeds as</p> <p>Visit A</p> <p>Visit left subtree:</p> <p> Visit B (its root)</p> <p> Visit its left subtree:</p> <p> Visit D</p> <p> Visit its right subtree:</p> <p> Visit E</p>

	<p>Visit right subtree:</p> <p>Visit C (its root)</p> <p>Visit its left subtree:</p> <p>Visit F</p> <p>Visit its right subtree:</p> <p>Visit G</p> <p>The order of nodes visited corresponds to answer B</p>
Tags	ATT-Transition-CSspeak_to_English, Contributor_Robert_McCartney, ATT-Type-How, Bloom-4-Application, Language-none-none-none, CS2, CodeLength-NotApplicable, TopicWG-Trees-Other

Field	Value
ID	634150 [created: 2013-06-24 11:13:30, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Junyoung runs the program after compiling with <code>gcc print_random_number.c -Wall</code> :</p> <pre>#include<stdlib.h> int main() { int x = rand(); printf("%d\n", x); }</pre> <p>What is not true about it?</p>
A	GCC will give a warning since stdio.h was not included
B	GCC will give a warning since <code>main</code> does not return an <code>int</code>
C	It will print a different number every time
D	It will only need four bytes of stack space
Explanation	Rand was not seeded.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ClassLibraries, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, CS2, LinguisticComplexity-2-Medium, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, TopicSimon-ProgrammingStandards, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	634148 [created: 2013-06-24 10:19:09, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Fill in the incomplete line of code so this recursively prints the contents of the array <code>arr</code> :</p> <pre>void print_array(int *arr, int length) { if(length > 0) { printf("%d\n", *arr); print_array(arr + 1, -----); } }</pre>
A	<code>print_array(arr + 1, 0);</code>
B	<code>print_array(arr + 1, length - 1);</code>
C	<code>print_array(arr + 1, ++length);</code>

D	print_array(arr + 1, length);
Explanation	Note the base case requires the length to be decreasing.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	634964 [created: 2013-06-29 22:18:46, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the following partial and incomplete <code>SpellChecker</code> class that uses an <code>ArrayList</code> to hold a reference list of correctly-spelled words:</p> <pre> public class SpellChecker { private List<String> dictionary; // spelling storage. // Line 1 // assume a constructor exists that correctly instantiates and // populates the list (i.e. loads the dictionary for the spellchecker) public boolean spelledCorrectly(String word) // Line 2 { for (int counter = 0; counter < _____; counter++) // Line 3 { if (word.equals(_____)) // Line 4 { return true; // Line 5 } } return false; // Line 6 } public void addWord(String word) // Line 7 { if (_____ // check word is NOT already in the dictionary // Line 8 { _____; // add word at end of the dictionary // Line 9 } } // other SpellChecker class methods would follow } </pre> <p>Choose the best choice to fill in the blank on line 9 so that the code operates correctly.</p>
A	<code>dictionary.set(word)</code>
B	<code>dictionary.put(counter, word)</code>
C	<code>dictionary.set(dictionary.length, word)</code>
D	<code>dictionary.add(word)</code>
E	<code>dictionary[dictionary.size()] = word</code>
Explanation	Use the <code>add()</code> method to add a new value to the end of a <code>List</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	634175 [created: 2013-06-24 14:36:30, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Seray is hashing the values 6, 96, 33, 77 into a hash table of size 10. Which hash function will give her no collisions?
A	$h(k) = k \% 10$
B	$h(k) = k / 10$
C	$h(k) = (k \% 10) + (k / 10)$

D	$h(k) = (k \% 10) - (k / 10)$
Explanation	A collides on 9/96; B does not collide; C collides on 6/33; D collides on 33/77.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium

Field	Value
ID	634177 [created: 2013-06-24 14:40:29, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	What does <code>atoi("hello")</code> return?
A	0
B	-1
C	hello
D	e
Explanation	it wil be 0
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-ClassLibraries, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634913 [created: 2013-06-19 11:13:26, author: crjrc (xchris), avg difficulty: 0.0000]
Question	In a hashtable that uses separate chaining to handle collisions, what, if any, restrictions should be placed on the table size?
A	Any number is fine, as the linear probing is guaranteed to find an element.
B	Any number is fine, since probing is irrelevant.
C	It should be a prime number, to ensure that in probing we will test each node.
D	It should be an odd number, to ensure that there's always a middle element.
Explanation	With separate chaining, no probing is done. Each entry in the table is a linked list, and all items with the hash index appear in the list.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634915 [created: 2013-06-29 21:24:54, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13 ... Any term (value) of the sequence that follows the first two terms (0 and 1) is equal to the sum of the preceding two terms. Consider the following incomplete method to compute any term of the Fibonacci sequence:</p> <pre> public static int fibonacci(int term) { int fib1 = 0; // Line 1 int fib2 = 1; // Line 2 int fibn = 0; // Line 3 if (term == 1) // Line 4 { return fib1; // Line 5 } if (term == 2) // Line 6 { return fib2; // Line 7 } for (_____) // Line 8: loop to the nth term </pre>

	<pre> { fibn = _____; // Line 9: compute the next term fib1 = _____; // Line 10: reset the second preceding term fib2 = _____; // Line 11: reset the immediate preceding term } return fibn; // Line 12: return the computed term } </pre> <p>Choose the best answer to fill in the blank on line 9.</p>
A	<code>fib2 - fib1</code>
B	<code>fib1 + fibn</code>
C	<code>fibn + fib2</code>
D	<code>fib1 + fib2</code>
E	<code>fib2</code>
Explanation	As described in the first part of the question, each term in the sequence is the sum of the previous two terms, so <code>fibn = fib1 + fib2</code> .
Tags	ATT-Transition-English_to_Code, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	634193 [created: 2013-06-24 15:09:16, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Which of the following is most appropriate as the missing post-condition?</p> <pre> void move_north_east(int *x, int *y) { // Moves a robot north-east in our coordinate system // by one step north and one step east // PRE: x != NULL, y != NULL // <missing post-condition> (*x)++; (*y)++; } </pre>
A	POST: x != NULL, y != NULL
B	POST: x is incremented; y is incremented
C	POST: x's pointee is incremented; y's pointee is incremented
D	POST: none
Explanation	what x points to is being updated, not x itself
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-Lifetime, TopicSimon-MethodsFuncsProcs, CS2, LinguisticComplexity-2-Medium, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	634920 [created: 2013-06-29 21:35:25, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>The Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13 ... Any term (value) of the sequence that follows the first two terms (0 and 1) is equal to the sum of the preceding two terms. Consider the following incomplete method to compute any term of the Fibonacci sequence:</p> <pre> public static int fibonacci(int term) { int fib1 = 0; // Line 1 int fib2 = 1; // Line 2 int fibn = 0; // Line 3 if (term == 1) // Line 4 { return fib1; // Line 5 } } </pre>

```

    if (term == 2)           // Line 6
    {
        return fib2;        // Line 7
    }

    for (_____)             // Line 8: loop to the nth term
    {
        fibn = _____; // Line 9: compute the next term
        fib1 = _____; // Line 10: reset the second preceding term
        fib2 = _____; // Line 11: reset the immediate preceding term
    }
    return fibn;             // Line 12: return the computed term
}

```

Choose the best answer to fill in the blank on line 10.

A	<input type="text" value="fib1"/>
B	<input type="text" value="fib2"/>
C	<input type="text" value="fibn"/>
D	<input type="text" value="fib1 + fib2"/>
E	<input type="text" value="fibn - fib2"/>
Explanation	Since each term in the sequence is formed by adding together the previous two terms, the local variables <input type="text" value="fib1"/> and <input type="text" value="fib2"/> are used to store the previous two terms for recall in computing the next value in the sequence. After computing the next term in the sequence, the loop moves the value of <input type="text" value="fib2"/> into <input type="text" value="fib1"/> , and the value of <input type="text" value="fibn"/> into <input type="text" value="fib2"/> , so that the previous two terms are ready for use in the next loop iteration.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	634190 [created: 2013-06-24 15:01:20, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Dhruv has some recursive code that contains the base case <input type="text" value="if(left > right)"/> Which algorithm is he <i>most</i> likely to be implementing?
A	heapsort
B	insertion sort
C	quicksort
D	Fibonacci
Explanation	Only quicksort is usually implemented with such a base case.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Language-C, Bloom-1-Knowledge, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic

Field	Value
ID	634924 [created: 2013-06-29 21:42:35, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	The Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13 ... Any term (value) of the sequence that follows the first two terms (0 and 1) is equal to the sum of the preceding two terms. Consider the following incomplete method to compute any term of the Fibonacci sequence: <pre> public static int fibonacci(int term) { int fib1 = 0; // Line 1 int fib2 = 1; // Line 2 int fibn = 0; // Line 3 if (term == 1) // Line 4 { return fib1; // Line 5 } if (term == 2) // Line 6 </pre>

```

    {
        return fib2;          // Line 7
    }

    for (-----)           // Line 8: loop to the nth term
    {
        fibn = -----; // Line 9: compute the next term
        fib1 = -----; // Line 10: reset the second preceding term
        fib2 = -----; // Line 11: reset the immediate preceding term
    }
    return fibn;             // Line 12: return the computed term
}

```

Choose the best answer to fill in the blank on line 11.

A	<input type="text" value="fib1"/>
B	<input type="text" value="fib2"/>
C	<input type="text" value="fibn"/>
D	<input type="text" value="fib1 + fib2"/>
E	<input type="text" value="fibn - fib1"/>
Explanation	Since each term in the sequence is formed by adding together the previous two terms, the local variables <input type="text" value="fib1"/> and <input type="text" value="fib2"/> are used to store the previous two terms for recall in computing the next value in the sequence. After computing the next term in the sequence, the loop moves the value of <input type="text" value="fib2"/> into <input type="text" value="fib1"/> , and the value of <input type="text" value="fibn"/> into <input type="text" value="fib2"/> , so that the previous two terms are ready for use in the next loop iteration.
Tags	ATT-Transition-English_to_Code, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	634926 [created: 2013-06-19 18:07:28, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	Polymorphism is used when different classes we are modeling can do the same thing (i.e. respond to the same method calls), and we don't know which class an object will be at compile time. In Java, this can be implemented using either inheritance or interfaces. Choose the best reason below for choosing inheritance polymorphism
A	There is no defined interface that works for all of the classes that I want to allow
B	The classes are closely related in the inheritance hierarchy;
C	The classes are in the same containment hierarchy
D	It is the kind of polymorphism that I understand the best
Explanation	If the classes are closely related in the inheritance hierarchy it should be possible to have the shared methods in some common superclass, which is close.
Tags	Contributor_Robert_McCartney, ATT-Type-Why, Difficulty-2-Medium, Language-Java, CSother, LinguisticComplexity-3-High, TopicSimon-OOconcepts, CodeLength-NotApplicable

Field	Value
ID	634927 [created: 2013-06-16 08:13:33, author: kate (xkate), avg difficulty: 0.0000]
Question	Given the following Java code: <pre> if (x >= 0) { System.out.println("1"); } else if (x < 20) { System.out.println("2"); } else { System.out.println("3"); } System.out.println("4"); </pre> <p>For what integer values of <input type="text" value="x"/> will 1 be among the values printed?</p>
A	$x < 0$
B	$x \geq 0$

C	<code>x >= 20</code>
D	All values of x
E	None of the above.
Explanation	The first branch of the conditional statement will print "1" for any x value greater than or equal to 0.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-1

Field	Value
ID	634928 [created: 2013-06-19 07:28:20, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	You are looking for a method <code>getSequence(int n, char c)</code> that returns a String of n characters c. Which of the following will not meet your needs?
A	<pre>String getSequence(int n, char c) { String s = ""; for (int i = 0; i < n; ++i) { s = s + c; } return s; }</pre>
B	<pre>String getSequence(int n, char c) { String s = ""; while (n > 0) { s += c; } return s; }</pre>
C	<pre>String getSequence(int n, char c) { return n * c; }</pre>
D	<pre>String getSequence(int n, char c) { String s = ""; for (int i = 1; i <= n; ++i) { s += c; } return s; }</pre>
E	<pre>String getSequence(int n, char c) { if (n == 0) { return ""; } else { return c + getSequence(n - 1, c); } }</pre>
Explanation	A char multiplied by an int produces an int, not a String. Example C doesn't even compile.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-1

Field	Value
ID	634937 [created: 2013-06-19 17:39:41, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre>public class RecursiveMath { ... public int fib (int a) { if (a < 2)</pre>

```

        return a;
    else
        return fib(a-1) + fib(a-2);
    }
    ...
}

```

Given the above definition, what is the result of executing the following?

```

RecursiveMath bill = new RecursiveMath();
int x = bill.fib(-1);

```

A	x is set to -1
B	x is set to undefined
C	The code does not terminate
D	The code cannot be executed, because it won't compile
E	None of the above
Explanation	Since fib is called with parameter of -1, a gets bound to -1. Since $a < 2$, the method returns the value of a, -1.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Robert_McCartney, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Language-Java, CS1, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion

Field	Value
ID	634941 [created: 2013-06-19 17:34:01, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> public class RecursiveMath { ... public int fib (int a) { if (a < 2) return a; else return fib(a-1) + fib(a-2); } ... } </pre> <p>What is the base case for <code>fib</code> in the above definition?</p>
A	a
B	<code>fib(a-1) + fib(a-2);</code>
C	<code>fib(a)</code> for <code>a < 2</code>
D	<code>fib(a)</code> for <code>a ≥ 2</code>
E	None of the above
Explanation	The base case is the version of the problem that can be solved directly, i.e. without a recursive call.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, Contributor_Robert_McCartney, Difficulty-1-Low, Language-Java, CS1, TopicSimon-Recursion

Field	Value
ID	634942 [created: 2013-06-24 14:44:28, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>What is the difference between</p> <pre> struct node* linked_list_node = malloc(sizeof(struct node)); linked_list_node->val = 3; linked_list_node->next = NULL; </pre>

	<p>and:</p> <pre>struct node linked_list_node;</pre> <div> <pre>linked_list_node.val = 3; linked_list_node.next = NULL;</pre> </div> <p>?</p>
A	The first needs more memory than the second
B	The first's node is stored on the heap; the second's is stored on the stack
C	The second is globally-accessible in the program; the first is locally accessible
D	There is no difference
Explanation	Dynamic alloc goes on heap; static goes on stack.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, SkillWG-AnalyzeCode, ATT-Type-Why, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-C, Bloom-3-Analysis, TopicSimon-Lifetime, LinguisticComplexity-1-Low, CS2, TopicWG-Recs-Structs-HeteroAggs, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, TopicSimon-Scope-Visibility, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634943 [created: 2013-06-29 21:14:24, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Consider the code</p> <pre>struct capacitor{</pre> <div> <pre> double capacitance; };</pre> </div> <p>If given the variable struct capacitor *cap, which of the following will NOT print the address of cap's capacitance?</p>
A	printf("%p\n", cap)
B	printf("%p\n", &(cap.capacitance))
C	printf("%p\n", &((*cap).capacitance))
D	printf("%p\n", &(cap->capacitance))
Explanation	C and D are equivalent; A is equivalent to them as capacitance is the first thing stored in the struct.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-IO, CS2, LinguisticComplexity-2-Medium, TopicWG-Pointers-ButNotReferences, TopicWG-Recs-Structs-HeteroAggs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634965 [created: 2013-06-29 21:58:42, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the following partial and incomplete <code>SpellChecker</code> class that uses an <code>ArrayList</code> to hold a reference list of correctly-spelled words:</p> <pre>public class SpellChecker { private List<String> dictionary; // spelling storage. // Line 1 // assume a constructor exists that correctly instantiates and // populates the list (i.e. loads the dictionary for the spellchecker)</pre>

```

public boolean spelledCorrectly(String word)           // Line 2
{
    for (int counter = 0; counter < _____; counter++) // Line 3
    {
        if (word.equals(_____))                     // Line 4
        {
            return true;                               // Line 5
        }
    }
    return false;                                     // Line 6
}

public void addWord(String word)                       // Line 7
{
    if (_____) // check word is NOT already in the dictionary // Line 8
    {
        _____; // add word at end of the dictionary // Line 9
    }
}

// other SpellChecker class methods would follow
}

```

Choose the best choice to fill in the blank on line 3 so that the code operates correctly.

A	<code>dictionary.size()</code>
B	<code>dictionary.length()</code>
C	<code>dictionary.size</code>
D	<code>dictionary.length</code>
E	<code>dictionary.get(counter)</code>
Explanation	The loop in <code>spelledCorrectly()</code> checks each word in the list called <code>dictionary</code> for the specified word, so the upper limit on the loop counter should be <code>dictionary.size()</code> . Remember that lists provide a <code>size()</code> method to retrieve the number of entries (the <code>length()</code> method is used for strings, and <code>length</code> as a field access is used for arrays).
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	634966 [created: 2013-06-29 22:15:18, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the following partial and incomplete <code>SpellChecker</code> class that uses an <code>ArrayList</code> to hold a reference list of correctly-spelled words:</p> <pre> public class SpellChecker { private List<String> dictionary; // spelling storage. // Line 1 // assume a constructor exists that correctly instantiates and // populates the list (i.e. loads the dictionary for the spellchecker) public boolean spelledCorrectly(String word) // Line 2 { for (int counter = 0; counter < _____; counter++) // Line 3 { if (word.equals(_____)) // Line 4 { return true; // Line 5 } } return false; // Line 6 } public void addWord(String word) // Line 7 { if (_____) // check word is NOT already in the dictionary // Line 8 { _____; // add word at end of the dictionary // Line 9 } } } </pre>

	<pre> // other SpellChecker class methods would follow } </pre>
	Choose the best choice to fill in the blank on line 8 so that the code operates correctly.
A	<code>!dictionary.contains(word)</code>
B	<code>!dictionary.find(word)</code>
C	<code>dictionary[word] == null</code>
D	<code>dictionary.get(word)</code>
E	<code>!dictionary.get(word)</code>
Explanation	To check whether a given value is present in a <code>List</code> , use the <code>contains()</code> method.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Strings

Field	Value
ID	634996 [created: 2013-06-19 07:10:17, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public BallPanel extends javax.swing.JPanel { 2. private Ball[] _balls; 3. public BallPanel(int numberOfBalls){ 4. _balls = new Ball[numberOfBalls]; 5. for (int i=0; i<_balls.length; i++) 6. _balls[i] = new Ball(); 7. } 8. public void ballCopy () { 9. Ball[] temp = new Ball[2 * _balls.length]; 10. for (int j=0; j< _balls.length; j++) 11. _temp[j] = _balls[j]; 12. _balls = temp; 13. } 13. ... </pre> <p>After executing</p> <pre> BallPanel myPanel = new BallPanel(10); _myPanel.ballCopy(); </pre> <p>Which of the following is true?</p>
A	The array <code>_balls</code> is unchanged in myPanel
B	The elements of <code>temp</code> are copies of the elements of <code>_balls</code> in myPanel
C	<code>_balls.length == 20</code> in myPanel
D	<code>_balls.length == 10</code> in myPanel
E	None of the above
Explanation	C is true. When you call <code>ballCopy</code> , it instantiates an array that is twice as large as <code>_balls</code> , which had length 10, then sets <code>_balls</code> to that new array.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, Difficulty-2-Medium, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, Bloom-4-Application, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634998 [created: 2013-06-26 06:08:52, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following method and indicate what value is displayed from the initial call statement from another method:</p> <pre> System.out.println(Ackermann(2,3)); public int Ackermann(int n, int m) { </pre>

	<pre> if (n==0) return (m+1); else if (m==0) return (Ackermann(n-1,1)); else return (Ackermann(n-1,Ackermann(n,m-1))); } </pre>
A	4
B	9
C	5
D	7
E	29
Explanation	Ackermann's function is one of the earliest <i>hyper-exponential</i> recursive functions. The key to obtaining the correct answer is in keeping which parameter is which, straight. Maybe, rename them as "red" and "blue" (instead of n and m) to reduce confusion.
Tags	Nested-Block-Depth-4-more, Contributor_Michael_Goldweber, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, CS2, LinguisticComplexity-3-High, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion

Field	Value
ID	634999 [created: 2013-06-29 22:46:07, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following algorithms use a divide-and-conquer strategy? (Circle all that apply.)
A	Merge sort
B	Insertion sort
C	Binary search
D	Linear search
Explanation	A and C are correct.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, MultipleAnswers-See-Explanation, TopicWG-Searching-Binary, TopicWG-Searching-Linear, TopicWG-Sorting-NlogN, TopicWG-Sorting-Quadratic, ConceptualComplexity-2-Medium

Field	Value
ID	635000 [created: 2013-06-19 06:55:07, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public BallPanel extends javax.swing.JPanel { 2. private Ball[] _balls; 3. private Ball[] _moreBalls; 4. public BallPanel(int numberOfBalls){ 5. _balls = new Ball[numberOfBalls]; 6. for (int i=0;i<_balls.length;i++) 7. _balls[i] = new Ball(); 8. _moreBalls = _balls; 9. } 10. public Ball[] getBalls(){ 11. return _balls; 12. } 13. public Ball[] getMoreBalls(){ 14. return _moreBalls; 15. } 16. ... </pre> <p>Which of the following statements is true, after executing the following code (assuming Ball has a constructor that takes a Color argument).</p> <pre> BallPanel myPanel = new BallPanel(5); </pre>

	<pre>myPanel.getMoreBalls()[0] = new Ball(java.awt.Color.pink);</pre> <p>?</p>
A	The array <code>_balls</code> in myPanel is unchanged
B	The array <code>_moreBalls</code> in myPanel is unchanged
C	The first element of <code>_moreBalls</code> in myPanel is a new <code>Ball</code> constructed using <code>new Ball(java.awt.Color.pink);</code> and is not the same as the first element of <code>_balls</code> in myPanel;
D	<code>myPanel.getBalls()[0] == myPanel.getMoreBalls()[0]</code>
E	The code will not execute because the second line has a syntax error.
Explanation	Because of line 9, both <code>_balls</code> and <code>_moreBalls</code> refer to the same array. Therefore, if I re-assign an element in one array, the change shows up under the other. Moreover, since it is really only one array the elements are identical, so <code>==</code> will be true in this case.
Tags	ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-3-High, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, Bloom-3-Analysis, CS1, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	635001 [created: 2013-06-26 05:57:33, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following function. What does it return?</p> <pre>public boolean nameTester(String inValue) { String oldValue = "mikeyg"; return (inValue == oldValue); }</pre>
A	True, regardless of the value of <i>inValue</i>
B	False, regardless of the value of <i>inValue</i>
C	It depends. If <i>inValue</i> is assigned the value "mikeyg," then True; otherwise False.
Explanation	The <code>==</code> (equality operator) for objects (strings are objects in Java) returns True when both operands refer to the same object. In this case, there are two distinct objects, who might contain the same value ("mikeyg").
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634144 [created: 2013-06-24 10:02:31, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following pairs of statements has two statements that are NOT equivalent?
A	<code>&arr[0];</code> and <code>arr;</code>
B	<code>arr[0];</code> and <code>*arr;</code>
C	<code>*(arr + 1);</code> and <code>arr[1];</code>
D	<code>*(arr + 1);</code> and <code>*(arr) + sizeof(arr[0]);</code>
Explanation	<code>*(arr + sizeof) != *(arr) + sizeof</code>
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, CS2, LinguisticComplexity-2-Medium, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635003 [created: 2013-06-29 22:52:47, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]

Question	<p>The following method, called <code>maxRow()</code>, is intended to take one parameter: a List where the elements are Lists of Integer objects. You can think of this parameter as a matrix—a list of rows, where each row is a list of "cells" (plain integers). The method sums up the integers in each row (each inner list), and returns the index (row number) of the row with the largest row sum. Choose the best choice to fill in the blank on Line 3 so that this method works as intended:</p> <pre> public static int maxRow(List<List<Integer>> matrix) { int maxVec = -1; // Line 1 int maxSum = Integer.MIN_VALUE; // Line 2 for (int row = 0; row < _____; row++) // Line 3 { int sum = 0; // Line 4 for (int col = 0; col < _____; col++) // Line 5 { sum = sum + _____; // Line 6 } if (_____) // Line 7 { maxSum = _____; // Line 8 maxVec = _____; // Line 9 } } return maxVec; // Line 10 } </pre>
A	<code>matrix.size()</code>
B	<code>matrix[0[]].size()</code>
C	<code>matrix[row][col]</code>
D	<code>matrix.length</code>
E	<code>maxVec</code>
Explanation	The blank on line three is the upper limit for the row count, controlling how many times the outer loop repeats. This should correspond to the number of rows in the <code>matrix</code> , or <code>matrix.size()</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, TopicWG-ADT-List-DefInterfaceUse, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium

Field	Value
ID	635007 [created: 2013-06-26 05:31:41, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	Which of the following run-times is NOT characteristic of a <i>feasible</i> (or <i>tractable</i>) algorithm?
A	$O(n^2)$
B	$O(n \log_2 n)$
C	$O(2^n)$
D	$O(n^3)$
E	$O(\log_2 n)$
Explanation	Feasible (or tractable) algorithms are one whose time is expressed as a polynomial in terms of the input set size n . $O(2^n)$ is exponential in n .
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Bloom-2-Comprehension, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634143 [created: 2013-06-24 09:58:27, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Consider the code</p> <pre> int i, *q, *p; p = &i; </pre>

	<pre>q = p; *p = 5;</pre>
	Which of the following will print out "The value is 5."?
A	<code>printf("The value is %d", &i);</code>
B	<code>printf("The value is %d", p);</code>
C	<code>printf("The value is %d", *q);</code>
D	<code>printf("The value is %d", *i);</code>
Explanation	q and p are sharing
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634140 [created: 2013-06-24 09:53:42, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Consider the code</p> <pre>int *p, *q, i;</pre> <pre>i = 3; q = p; q = &i; printf("The value of p is %d which points to %d.\n", p, *p);</pre> <p>Which of the following would you expect the program to print?</p>
A	The value of p is 0x3eee198e1e1 which points to 3.
B	The value of p is 0 which points to 0.
C	The value of p is -29389112111 which points to 3.
D	Segmentation fault
Explanation	p was never assigned! While p and q are sharing for a while that does not mean they are the same.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635009 [created: 2013-06-26 03:57:19, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following predicate (boolean) <i>accessor</i> function:</p> <pre>def blockedWithinOneMove(self): if (not self.frontIsClear()): return (True) else: self.move() if (not self.frontIsClear()): return (True) else: return (False)</pre> <p>What is logically wrong with this predicate accessor function? The error is semantic and not syntactic.</p>
A	If the robot is blocked, after moving forward, this function incorrectly returns True.

B	If the robot is not blocked, after moving forward, this function incorrectly returns False.
C	This function returns True when it should return False, and returns False when it should return True.
D	In some cases, the preconditions do not match the postconditions; i.e. the state has changed.
E	The robot moves, but does not change reverse direction.
Explanation	Accessor functions need to guarantee that the program state does not change. The robot moves forward to check for a wall, but fails to return to its starting location - which is necessary since this is an <i>accessor</i> method.
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	635010 [created: 2013-06-29 21:02:15, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>What value will this code print out on a 64-bit Linux machine with gcc?</p> <pre> int main { int key = get_key("zflsbi-k#gk!2*8jc5r:/bb&fc:j\x42\x20\x46\x4e"); printf("%d\n", key); } int get_key(char *bar) { // PRE: bar is != NULL // POST: key is a happy number! assert(bar); int key = 10; char c[28]; memcpy(c, bar, strlen(bar)); assert(key <= INT_MAX && key > INT_MIN); return key; } </pre>
A	The code will not run; the asserts will trigger
B	10
C	1109411406
D	1313218626
E	3831759396
Explanation	There's a stack buffer overflow due to the memcpy, so the method will return 0x4e462042 (Little Endian); in decimal that is 1313218626.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-TestProgram, ATT-Type-How, Difficulty-3-High, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Language-C, Bloom-3-Analysis, TopicWG-Numeric-Int-Representatio, TopicWG-Numeric-Int-Truncation, LinguisticComplexity-1-Low, CS2, TopicWG-Runtime-StorageManagement, CodeLength-lines-06-to-24_Medium, TopicSimon-Scope-Visibility, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	635011 [created: 2013-06-19 06:21:18, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. import java.util.ArrayList; 2. public BallPanel extends javax.swing.JPanel { 3. private Ball[] _balls; 4. private ArrayList <Ball> _moreBalls; </pre>

```

5.     public BallPanel(){
6.         _balls = new Ball[20];
7.         _moreBalls = new ArrayList<Ball>();
8.         for (int i=0;i<10;i++) {
9.             _balls[i] = new Ball();
10.            _moreBalls.add(_balls[i]);
11.        }
12.    }
13. ...

```

After line 11, what are the values of `_balls.length` and `_moreBalls.size()` respectively?

A 0,0

B 10,10

C 20,20

D 10,20

E 20,10

Explanation `_balls.length` is set to 20 when the array is instantiated (in line 6) and is independent of the array contents.

`_moreBalls.size()` indicates the number of values stored in the ArrayList, which is 10 from the 10 adds in the loop.

Tags ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, Difficulty-1-Low, TopicSimon-Arrays, TopicSimon-CollectionsExceptArray, Language-Java, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634995 [created: 2013-06-29 22:28:37, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this method skeleton for <code>findDigit()</code>:</p> <pre> /** * Returns the number of times the digit d occurs in the decimal * representation of n. * @param n The number to consider (must be non-negative). * @param d The digit to look for (must be 0-9). * Returns the number of times d occurs in the printed representation * of n. */ public int findDigit(int n, int d) // Line 1 { int count = 0; // Line 2 if (_____) // Line 3 { _____; // Line 4 } while (n > 0) // Line 5 { if (n % 10 == d) // Line 6 { count++; // Line 7 } return 1; // Line 8 } return count; // Line 9 } </pre> <p>Select the best choice to fill in the blank on line 3 in this method to produce the correct behavior.</p>
A	<code>d == 0</code>
B	<code>n == 0</code>
C	<code>n == 0 && d == 0</code>
D	<code>n < d</code>
E	<code>n = n - d</code>

Explanation	The blank on line 3 checks a special case where the loop is never needed--when both the <code>n</code> passed in and the digit being search for are both zero, and the result of the method should be 1. Therefore, the condition should be <code>n == 0 && d == 0</code> .
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	634993 [created: 2013-06-29 22:35:40, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this method skeleton for <code>findDigit()</code>:</p> <pre> /** * Returns the number of times the digit d occurs in the decimal * representation of n. * @param n The number to consider (must be non-negative). * @param d The digit to look for (must be 0-9). * Returns the number of times d occurs in the printed representation * of n. */ public int findDigit(int n, int d) // Line 1 { int count = 0; // Line 2 if (n == 0 && d == 0) // Line 3 { -----; // Line 4 } while (n > 0) // Line 5 { if (n % 10 == d) // Line 6 { count++; // Line 7 } -----; // Line 8 } return count; // Line 9 } </pre> <p>Select the best choice to fill in the blank on line 4 in this method to produce the correct behavior.</p> <p>A <code>return 0;</code></p> <p>*B* <code>return 1;</code></p> <p>C <code>return n;</code></p> <p>D <code>return d;</code></p> <p>E <code>return count;</code></p>
Explanation	The test on line 3 checks a special case where the loop is never needed--when both the <code>n</code> passed in and the digit being search for are both zero. In this situation, the result of the method should be 1.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	634967 [created: 2013-06-27 04:30:32, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>What algorithm does <i>mystery</i> implement when passed a list of values as its argument?</p> <pre> def helper (listOfValues, start): largestSoFar = listOfValues[start] largestIndex = start current = start+1 while (current < len(listOfValues)): if (listOfValues[current] > largestSoFar): largestSoFar = listOfValues[current] largestIndex = current current = current + 1 return (largestIndex) </pre>

	<pre>def mystery (listOfValues): leftEdge = 0 while (leftEdge < (len(listOfValues)-1)): biggestPosition = helper (listOfValues, leftEdge) temp = listOfValues[biggestPosition] listOfValues[biggestPosition] = listOfValues[leftEdge] listOfValues[leftEdge] = temp leftEdge = leftEdge + 1 return (listOfValues)</pre>
A	List Reverser
B	Insertion Sort
C	Quicksort
D	Selection Sort
E	Bubble Sort
Explanation	Helper is an implementation of <i>Find Largest</i> . By repeatedly invoking Find Largest, the <i>mystery</i> algorithm implements selection sort
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicWG-Sorting-Quadratic

Field	Value
ID	634969 [created: 2013-06-11 10:10:26, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following interface definition:</p> <pre>public interface Mover { public int getX(); public int getY(); public void setLocation(int x, int y); }</pre> <p>Choose the best answer to describe the following implementation of that interface:</p> <pre>public class CartoonCharacter implements Mover{ private int x, y; public int getX() {return this.x;} public int getY() {return this.y;} }</pre>
A	The class correctly implements the <code>Mover</code> interface because it says <code>implements Mover</code> .
B	The class does not correctly implement the <code>Mover</code> interface because it includes method bodies for <code>getX</code> and <code>getY</code> .
C	The class does not correctly implement the <code>Mover</code> interface because it has instance variables.
D	The class does not correctly implement the <code>Mover</code> interface because it fails to define the <code>setLocation</code> method.
E	Both B and C.
Explanation	<p>To implement a Java interface, a class must define all the methods required by the interface (or declare itself abstract).</p> <p>Note: There is no appropriate topic for this question. Suggestion: TopicSimon-Interface-Java.</p>
Tags	Contributor_Kate_Sanders, Skill-DebugCode, ATT-Transition-Code_to_CSspeak, Difficulty-1-Low, ATT-Type-Why, TopicSimon-AAA-XX-ChooseUpToThree, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634974 [created: 2013-06-27 03:48:41, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	What does the following Python method do?

	<p>Note: lov stands for list of values.</p> <pre>def foo (lov): listSize = len(lov) current = 1 flag = True while ((current < listSize) and flag): if (lov[current] < lov[current-1]): flag = False current = current + 1 return (flag)</pre>
A	Implements the sequential search algorithm.
B	Determines if the input list is sorted in ascending order.
C	Implements the selection sort algorithm.
D	Determines if the input list is sorted in descended order
E	None of the above
Explanation	Flag is set to true and when two adjacent list items are found to be out of place, with respect to a non-decreasing sorted order, flag is set to false.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Michael_Goldweber, ATT-Transition-Code_to_English, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634977 [created: 2013-06-27 03:38:26, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following class definition:</p> <pre>public class Mystery { private ArrayList<Stuff> myStuff; public Mystery() { myStuff = new ArrayList<Stuff> (); } public Stuff foo1 (int id) { int i = 42; ... code deleted... return myStuff[i]; } public void foo2 (int id) { int i = -2; ... code deleted... } public Stuff foo3 (int id) { int i = 0; ... code deleted... return myStuff[i]; } } // End of class Mystery</pre> <p>True or False: "i" should be upgraded to an instance variable.</p>
A	True
B	False
Explanation	False. Instance variables should only be declared for persistent data. "i" is a local variable which contains no persistent data. Even though it is used in ALL the class's methods, that is not justification to make it an instance variable.
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-Why, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts,

CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634981 [created: 2013-06-22 07:37:04, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Java implementation of a Stack:</p> <pre> public class Stack<E> extends LinkedList<E>{ private int size=0; public int size(){ return size; } public void push(E e){ add(e); size+=1; } public E pop() { size-=1; return removeLast(); } } </pre> <p>What does the following code output?</p> <pre> Stack<Integer> q=new Stack<Integer>(); q.push(10); q.push(20); q.clear(); // clear() is inherited from LinkedList System.out.println(q.size()); </pre>
A	0
B	2
C	throws a Runtime exception
D	throws a checked exception (i.e. this code won't compile unless the code is surrounded by a try-catch block, or the method it is located inside declares that it throws the exception)
Explanation	<p>This is a classic case of using extends improperly. Remember that inheritance in Java (or any other Object-oriented language) creates an IS-A relationship. But, a Stack IS NOT a LinkedList, because there are things you can do to a LinkedList that you cannot do to a Stack, such as invoke clear().</p> <p>Another way to think about this is that inheritance inherits ALL public methods, and allows those methods to be used by the subclass. For this Stack class, all of those inherited methods, such as clear(), can be called to change the state of the instance, but they don't know to pay attention to the size variable.</p>
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-DefInterfaceUse, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, CodeLength-lines-25-or-more_High, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	634983 [created: 2013-06-26 08:31:57, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	The <i>All-Pairs</i> list programming pattern typically runs in time?
A	$O(n^2)$
B	$O(n)$
C	$O(n \log_2 n)$
D	$O(1)$
E	$O(2^n)$
Explanation	The <i>All-Pairs</i> programming pattern typically compares each element in a list to each other element in the list. Hence the first element is compared against n-1 other values. The second element is compared against n-2 other values, etc. Hence one gets a quadratic run time.
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-

Medium, Block-Horizontal-2-Struct_Control, TopicSimon-Arrays, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable

Field	Value
ID	634985 [created: 2013-06-26 08:15:04, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	C++ uses
A	call by name
B	call by reference
C	call by value
D	call by value-return
E	call by value AND call by reference
Explanation	C++ defaults to call by value, but allows for special syntax to force call-reference.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Cplusplus, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-NotApplicable, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634986 [created: 2013-06-21 19:04:16, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Assume M and N are positive integers. What does the following code print?</p> <pre> int sum=0; for (int j=0; j<M; j++) { for (int i=0; i<N; i++) { sum += 1; } } System.out.println(sum); </pre>
A	M+N
B	M*N
C	M ^N
D	0
E	none of the above
Explanation	For positive integers M and N, this prints M*N
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	634987 [created: 2013-06-26 08:09:56, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following:</p> <pre> public void foo (int x) { ... } </pre> <p>What is x?</p>
A	A global variable.
B	A local variable.

C	The actual parameter.
D	The formal parameter.
E	An instance variable.
Explanation	When invoking a method, the invocation contains the <i>actual</i> parameters, while the variables defined in the method signature define the <i>formal</i> parameters.
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634988 [created: 2013-06-26 08:05:17, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	Java uses:
A	call by reference
B	call by value
C	call by name
D	call by value-return
Explanation	Java uses call by value. If the given parameter is an object, which is really a reference, then under call by value, the formal parameter is really just an alias (additional reference) to the actual parameter object.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Michael_Goldweber, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-NotApplicable

Field	Value
ID	634990 [created: 2013-06-19 07:23:22, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> 1. public BallPanel extends javax.swing.JPanel { 2. private Ball[] _balls; 3. public BallPanel(int numberOfBalls){ 4. _balls = new Ball[numberOfBalls]; 5. for (int i=0; i<_balls.length; i++) 6. _balls[i] = new Ball(); 7. } 8. public void ballCopy () { 9. Ball[] temp = new Ball[2 * _balls.length]; 10. for (int j=0; j< _balls.length; j++0) 11. _temp[j] = _balls[j]; 12. _balls = temp; 13. } 13. ... </pre> <p>What is the purpose of the <code>ballCopy</code> method?</p>
A	It allows the user to copy a <code>Ball</code> in a <code>BallPanel</code>
B	It copies data in the <code>_balls</code> array
C	It increases the capacity of the <code>_balls</code> array while keeping existing data
D	It makes 2 copies of the elements in the <code>_balls</code> array
E	It swaps the data in the <code>_balls</code> array with the data in the <code>temp</code> array
Explanation	It doubles the length of the <code>_balls</code> array. It works by 1) instantiating <code>temp</code> , an array twice as large as <code>_balls</code> , 2) copying the data in <code>_balls</code> to the first half of <code>temp</code> , and 3) reassigning <code>_balls</code> to be <code>temp</code> . Useful if you want to have an array that can grow bigger when it gets full.
Tags	ATT-Transition-Code_to_English, Skill-ExplainCode, Contributor_Robert_McCartney, ATT-Type-How, ATT-Type-Why, Difficulty-2-Medium, TopicSimon-Arrays, TopicSimon-Assignment, Language-Java, Bloom-4-Application, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	634991 [created: 2013-06-29 22:41:31, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider this method skeleton for <code>findDigit()</code>:</p> <pre> /** * Returns the number of times the digit d occurs in the decimal * representation of n. * @param n The number to consider (must be non-negative). * @param d The digit to look for (must be 0-9). * Returns the number of times d occurs in the printed representation * of n. */ public int findDigit(int n, int d) // Line 1 { int count = 0; // Line 2 if (-----) // Line 3 { -----; // Line 4 } while (n > 0) // Line 5 { if (n % 10 == d) // Line 6 { count++; // Line 7 } -----; // Line 8 } return count; // Line 9 } </pre> <p>Select the best choice to fill in the blank on line 8 in this method to produce the correct behavior.</p> <p>A <code>n = n % 10;</code></p> <p>B <code>n = n - d;</code></p> <p>C <code>n = n + d;</code></p> <p>D <code>n = Integer.toString(n).substring(1);</code></p> <p>*E* <code>n = n / 10;</code></p> <p>Explanation The loop in this method traverses through the digits in the specified number <code>n</code> from right-to-left—from least significant digit to most significant. Each iteration of the loop examines the rightmost digit that remains by using the modulo operator. To strip off and remove the least significant digit in <code>n</code> to prepare for the next iteration of the loop, use <code>n = n / 10;</code>.</p> <p>Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicWG-Numeric-Int-Range, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low</p>

Field	Value
ID	634992 [created: 2013-06-26 07:59:46, author: mikeyg (xmikey), avg difficulty: 0.0000]
Question	<p>Consider the following: When <code>foo</code> is executed, what is printed out?</p> <pre> public void foo () { int x = 42; int y = 24; mystery (x, y); System.out.println (x + " " + y); } public void mystery (int var1, int var2) { int temp = var1; var1 = var2; var2 = temp; } </pre>

A	42 24
B	24 42
Explanation	Java is a pass-by-VALUE language. Hence <i>mystery</i> , does not accomplish the desired swapping of values.
Tags	ATT-Transition-Code_to_CSspeak, Contributor_Michael_Goldweber, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	634131 [created: 2013-06-24 08:11:54, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	<p>Yuchi has the following code:</p> <pre>#DEFINE N 500 ---- (other code skipped) ---- int arr[N][N]; int i; int j; for(i = 0; i < N; i++) { for(j = 0; j < N; j++) { arr[i][j] = i + j; } }</pre> <p>When he changes N to 500,000, his code crashes. Why?</p>
A	There is a memory leak in the code
B	<code>arr</code> is on the stack; it has run out of stack space
C	<code>arr</code> is on the heap; it has run out of heap space
D	With N that large, there will be at least one integer overflow in the code
Explanation	arr is stored on the stack as it was statically allocated; the stack has limited space.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, SkillWG-AnalyzeCode, ATT-Type-Why, Difficulty-3-High, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Language-C, Block-Vertical-4-Macro-Structure, TopicSimon-DataTypesAndVariables, Bloom-5-Synthesis, TopicSimon-Lifetime, CS2, LinguisticComplexity-2-Medium, TopicWG-Runtime-StorageManagement, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium

Field	Value
ID	629962 [created: 2013-06-11 10:50:06, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you have a Java array of ints. What is the worst-case time complexity of retrieving a value from a given location in the array?
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n \log n)$
E	$O(n^2)$
Explanation	Retrieving a value from an array can be done in constant time.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-AAA-XXXXXXXXXXXXXXXXXXXXXXXXXXXX, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630968 [created: 2013-06-13 12:31:45, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]

Question	In Java, what word is used to refer to the current object, or to call one constructor from another in the same class?
A	constructor
B	<code>new</code>
C	<code>null</code>
D	<code>this</code>
E	<code>void</code>
Explanation	The reserved word <code>this</code> is used within a method or constructor to refer to the current object, or in the first statement of a constructor to call a different constructor in the same class.
Tags	ATT-Transition-CSSpeak_to_Code, Skill-PureKnowledgeRecall, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, CS1, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630969 [created: 2013-06-13 11:43:31, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<div><pre>classDiagram class Vehicle { <<abstract>> +move()* +carryCargo() } class Truck { +_weight: int +Truck(int) +Truck() +move() } class Car { +#_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class OilTanker { +_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- Car Truck < -- OilTanker Car .. > PeopleHauler</pre></div> <p>Using the information in the UML diagram above: Suppose the statement</p> <pre><code>super.carryCargo();</code></pre> <p>appears in the body of the <code>carryCargo</code> method of <code>OilTanker</code>. Which method does the statement invoke?</p>

A

The `carryCargo` method defined in `OilTanker`

B

The `carryCargo` method defined in `Vehicle`

C

The `carryCargo` method defined in `Truck`

D

None of the above is true

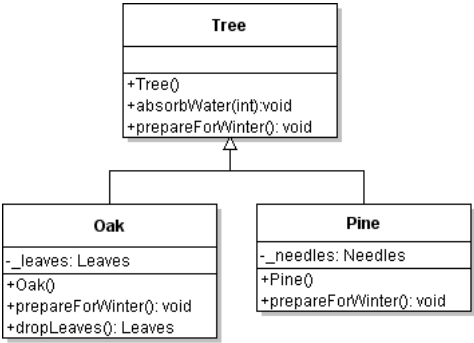
Explanation

`super.carryCargo()`, when called from a method in `OilTanker`, resolves the method starting from the superclass, that is, it treats the instance as if its actual type was `Truck`. Since there is no `carryCargo` method defined in `Truck`, the one used is the one inherited from `Vehicle`.

Tags

Contributor_Robert_McCartney

Field	Value
ID	630970 [created: 2013-06-13 12:07:28, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	



Using the information in the UML diagram above, suppose an `Oak` prepares for winter like a `Tree` , but it drops its leaves first. What code should replace `???` in the following code?

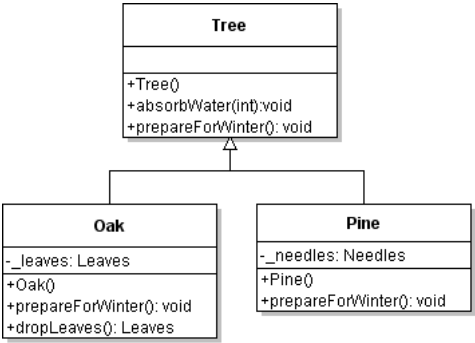
```
public class Oak extends Tree {
    ...
    public void prepareForWinter(){
        this.dropLeaves();
        ???
    }
}
```

A	<code>Tree.prepareForWinter();</code>
B	<code>super.this();</code>
C	<code>super.prepareForWinter();</code>
D	<code>this.absorb(new Water());</code>
E	<code>super(this);</code>
Explanation	To make an Oak prepare for winter "like a tree" after dropping its leaves, you can simply have Oak invoke Tree's prepareForWinter method. Alternative A would work if prepareForWinter were static, but that is not indicated on this diagram (and would be really odd from a modeling perspective).
Tags	Contributor_Robert_McCartney

Field	Value
ID	630975 [created: 2013-06-13 12:41:33, author: kate (xkate), avg difficulty: 0.0000]
Question	Consider the following Java method: <pre>public xxx printGreeting() { // 1 System.out.println("Hello!"); // 2 } // 3</pre> <p>The xxx in line 1 is best replaced by:</p>
A	double
B	float
C	int
D	String
E	void
Explanation	E is the correct answer, because the method does not return a value.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, ATT-Type-How, Skill-WriteCode_MeansChooseOption, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630980 [created: 2013-06-13 12:25:17, author: xrobert (xrobert), avg difficulty: 0.0000]

Question



Using the information in the UML diagram above, suppose `russell` is a `Crow`, and lives in an `Oak`. What answer best describes what can replace `???` in the following code?

```
public class Crow extends Bird {
    private Tree _myTree;
    ...
    public void battenDown(){
        ...
        _myTree.???
    }
}
```

A	<code>prepareForWinter();</code> or <code>absorbWater(n);</code> (where <code>n</code> is an <code>int</code> variable or constant) or <code>dropLeaves();</code>
B	<code>prepareForWinter();</code> or <code>absorbWater(n);</code> (where <code>n</code> is an <code>int</code> variable or constant)
C	<code>dropLeaves();</code>
D	Any public method from <code>Tree</code> or anything above it in the inheritance hierarchy (with appropriate parameters)
E	Any public method from <code>Oak</code> or anything above it in the inheritance hierarchy (with appropriate parameters)
Explanation	Since you are invoking a method on a variable whose declared type is <code>Tree</code> , only methods appropriate to <code>Tree</code> can be invoked, that is, those defined in <code>Tree</code> or inherited from an ancestor in the inheritance hierarchy. B gives the methods from <code>Tree</code> that can be invoked, but methods inherited by <code>Tree</code> that can be used as well. If anything in the inheritance hierarchy had public instance variables, those names could also appear in that line, but it would be bad form to have public instance variables, and wouldn't make any sense without being assigned to something.
Tags	Contributor_Robert_McCartney

Field	Value
ID	630981 [created: 2013-06-13 12:52:56, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Which of the following statements about constructors is NOT true?
A	All constructors must have the same name as the class they are in.
B	A constructor's return type must be declared <code>void</code> .
C	A class may have a constructor that takes no parameters.
D	A constructor is called when a program creates an object with the <code>new</code> operator.
E	A constructor of a subclass can call a constructor of its superclass using the Java reserved word <code>super</code> .
Explanation	In Java, a constructor does not have a return type, unlike a method.
Tags	ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-

Vertical-2-Block, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630985 [created: 2013-06-13 13:00:22, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Given the following Boolean expression:</p> <pre>(jordan.getGridX() < 100) && (jordan.getGridY() >= 55)</pre> <p>Which of the following is logically equivalent?</p>
A	<pre>!((jordan.getGridX() >= 100) (jordan.getGridY() < 55))</pre>
B	<pre>((jordan.getGridX() >= 100) (jordan.getGridY() < 55))</pre>
C	<pre>!((jordan.getGridX() > 100) (jordan.getGridY() <= 55))</pre>
D	<pre>!((jordan.getGridX() < 100) (jordan.getGridY() >= 55))</pre>
E	none of these
Explanation	This question involves applying De Morgan's Law to factor out logical negation from a Boolean expression to find an equivalent expression.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Java, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630988 [created: 2013-06-13 13:07:32, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the following code segment:</p> <pre>if (!this.seesNet(LEFT) && this.seesFlower(AHEAD)) { this.hop(); this.pick(); } else { this.turn(RIGHT); }</pre> <p>Which of the following alternative versions is logically equivalent to (produce the same behavior as) the original?</p>
A	<pre>if (this.seesNet(LEFT) this.seesFlower(AHEAD)) { this.turn(RIGHT); } else { this.pick(); this.hop(); }</pre>
B	<pre>if (!(this.seesNet(LEFT) && !this.seesFlower(AHEAD))) { this.turn(RIGHT); } else { this.hop(); this.pick(); }</pre>
C	<pre>if (this.seesNet(LEFT) !this.seesFlower(AHEAD)) { this.turn(RIGHT); }</pre>

	<pre> else { this.hop(); this.pick(); } </pre>
D	<pre> if (this.seesNet(LEFT) && !this.seesFlower(AHEAD)) { this.turn(RIGHT); this.turn(RIGHT); this.turn(RIGHT); } else { this.pick(); this.hop(); } </pre>
Explanation	The correct alternative has the same actions in both branches of the if statement, but in reversed positions--the true branch has moved to the false branch, and vice versa. At the same time, the logical condition in the if statement is the opposite of the original condition (by applying De Morgan's Law). Together, these two conditions produce a behaviorally equivalent block of code.
Tags	Nested-Block-Depth-1, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

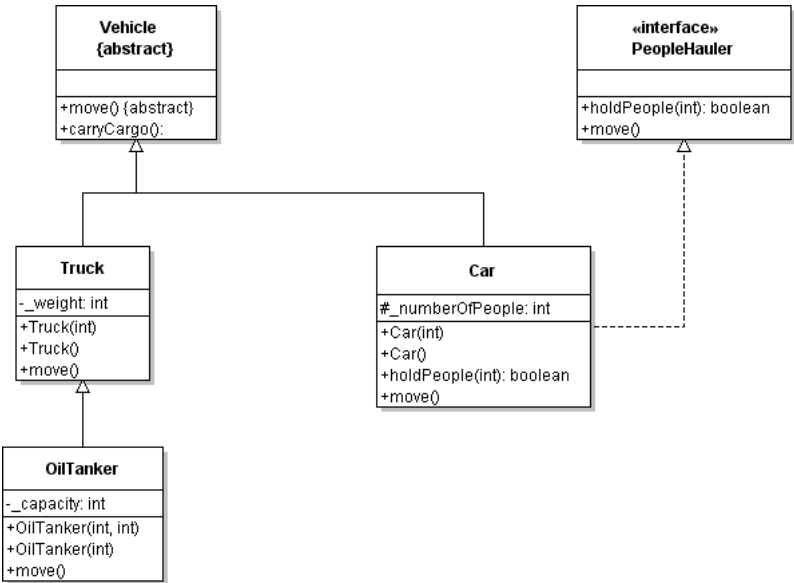
Field	Value
ID	630989 [created: 2013-06-13 13:11:54, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	For any JUnit test class, when is the <code>setUp()</code> method executed?
A	Only when explicitly invoked
B	Once before all the test methods are executed
C	Each time before a test method is executed
D	Only after the test class constructor method is executed
E	None of the above
Explanation	The <code>setUp()</code> method is used to set up the same starting conditions for all test methods in a test class. It is automatically executed before each test method, for every test method in the class.
Tags	ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-3-Relations, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Testing

Field	Value
ID	630995 [created: 2013-06-13 13:25:21, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	In the Java language, what is the value of this expression? <code>8 / 5 + 3.2</code>
A	<code>3</code>
B	<code>3.2</code>
C	<code>4.2</code>
D	<code>4.8</code>
E	<code>6</code>
Explanation	Because of precedence, the division operator is applied first. Since it is applied between two <code>int</code> values, the result is also an <code>int</code> , with any fractional part truncated. The result of the division is therefore 1. Next, the addition is performed, giving the result: 4.2.
Tags	ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, TopicWG-Numeric-Int-Truncation, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631000 [created: 2013-06-13 13:19:43, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	Which of the following is <i>not</i> true about an <code>interface</code> in Java?
A	Defines a type
B	Must include a constructor
C	Must not include method implementations
D	A class may implement more than one interface
E	None of these
Explanation	Interfaces cannot be instantiated and cannot contain method bodies. As a result, they may not contain constructors.
Tags	ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Contributor_Stephen_Edwards, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-2-Block, TopicWG-JavaInterface, Bloom-1-Knowledge, Language-Java, CS1, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630965 [created: 2013-06-10 10:49:32, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> classDiagram class Vehicle { <<abstract>> +move() {abstract} +carryCargo() } class Truck { #_weight: int +Truck(int) +Truck() +move() } class OilTanker { -_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class Car { -_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- Car Truck < -- OilTanker Car .. > PeopleHauler </pre> <p>The # in the above UML diagram for <code>Truck</code>'s instance variable <code>_weight</code> means that:</p>
A	<code>_weight</code> is measured in pounds
B	<code>_weight</code> is a <code>private</code> variable
C	<code>_weight</code> is a <code>protected</code> variable
D	<code>_weight</code> is a number
E	None of the above
Explanation	The # sign is used with as a prefix for protected instance variables (or methods) in a UML class diagram.
Tags	Contributor_Robert_McCartney, Difficulty-1-Low

Field	Value
ID	630927 [created: 2013-06-10 11:14:07, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	



Using the information in the UML diagram above, suppose I have a method (defined in some other class not on this diagram) with signature:

```
public void transportPeople(PeopleHauler mobile)
```

which methods can be used with parameter mobile in this method?

A	All of the methods of <code>mobile</code> 's actual class
B	Only <code>move()</code> and <code>carryCargo()</code>
C	Only <code>move()</code> and <code>holdPeople(int)</code>
D	Only <code>move()</code> , <code>carryCargo()</code> , and <code>holdPeople(int)</code>
E	Only <code>move()</code>
Explanation	Only the methods defined in the <code>interface PeopleMover</code> can be used, independent of the actual type -- these are the only methods guaranteed to be present, as all we know about the variable is that it is some class that implements this <code>interface</code>
Tags	Contributor_Robert_McCartney

Field	Value
ID	629963 [created: 2013-06-11 11:02:34, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you have a sorted list stored in consecutive locations in a Java array. What is the worst-case time complexity of inserting a new element in the list?
A	O(1)
B	O(log n)
C	O(n)
D	O(n log n)
E	O(n ²)
Explanation	In order to make room for a new element in the array, it may be necessary to shift all the other elements. Note: There is no skill tag for this type of question. Suggestion: Skill-Analyze-Code
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-AAA-XXXXXXXXXXXXXXXXXXXXXXXXXXXX, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, CS2, LinguisticComplexity-2-Medium, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	629969 [created: 2013-06-11 11:29:30, author: kate (xkate), avg difficulty: 0.0000]

Question	Suppose you have a sorted list of numbers stored in a Java array of ints. What is the worst-case time complexity of searching for a given number in the list using binary search?
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n \log n)$
E	$O(n^2)$
Explanation	Binary search in a sorted array can be implemented in $O(\log n)$ time Note: It is likely that the instructor went over this in class. If so, perhaps it should be tagged as Skill-Pure-Knowledge-Recall.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-AAA-XXXXXXXXXXXXXXXXXXXX, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	630264 [created: 2013-06-12 06:04:03, author: crjirc (xchris), avg difficulty: 0.0000]
Question	This sorting algorithm roughly orders elements about a pivot element and then sorts the subarray of elements less than the pivot and the subarray of elements greater than the pivot.
A	selection sort
B	insertion sort
C	bubble sort
D	quick sort
E	merge sort
Explanation	Quick sort puts all elements less than the pivot element before the pivot and all elements greater after the pivot. Then it sorts these two halves.
Tags	Contributor_Chris_Johnson

Field	Value
ID	630661 [created: 2013-06-12 23:55:14, author: tclear (xtony), avg difficulty: 0.0000]
Question	What effect does the statement Option Explicit in the declaration section have on a Visual Basic module?
A	The programmer is given the option to save code before the program is run.
B	All variables in the module have to be declared before use.
C	Global variables may be declared in the declarations section.
D	Procedures in the module may be accessed from other modules in the project.
E	Procedures in the module may NOT be accessed from other modules in the project.
Explanation	"When Option Explicit appears in a file, you must explicitly declare all variables using the Dim or ReDim statements. If you attempt to use an undeclared variable name, an error occurs at compile time. Use Option Explicit to avoid incorrectly typing the name of an existing variable or to avoid confusion in code where the scope of the variable is not clear. If you do not use the Option Explicit statement, all undeclared variables are of Object type". Ref http://msdn.microsoft.com/en-us/library/y9341s4f%28v=vs.80%29.aspx
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-VB, CS1, CodeLength-NotApplicable, TopicSimon-ProgrammingStandards, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value

ID	630747 [created: 2013-06-13 01:55:11, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following class definition.</p> <pre> import java.util.Scanner; // 1 public class SillyClass2 { // 2 private int num, totalRed, totalBlack; // 3 public SillyClass2 () { // 4 num = 0; // 5 totalRed = 0; // 6 totalBlack = 0; // 7 this.spinWheel(); // 8 System.out.print("Black: " + totalBlack); // 9 System.out.println(" and red: " + totalRed); // 10 } // 11 public void spinWheel () { // 12 Scanner kbd = new Scanner(System.in); // 13 System.out.println("Enter 1 or 0, -1 to quit."); // 14 num = kbd.nextInt(); // 15 while (num >= 0) { // 16 if (num == 0) // 17 totalRed++; // 18 else if (num == 1) // 19 totalBlack++; // 20 else System.out.println("Try again"); // 21 System.out.println("Enter 1 or 0, -1 to quit."); // 22 num = kbd.nextInt(); // 23 } // 24 System.out.println("Thanks for playing."); // 25 } // 26 } // 27 </pre> <p>If line 1 is omitted, which other line(s) of code will cause compile errors?</p>
A	Lines 9,10
B	Lines 13, 15, 23
C	Lines 14, 21, 22, 25
D	All of the above
Explanation	Importing <code>java.util.Scanner</code> allows us to declare, initialize, and use a <code>Scanner</code> object. It is not needed for <code>println</code> statements.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ClassLibraries, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-IO, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Testing

Field	Value
ID	630778 [created: 2013-06-13 04:01:50, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following class definition.</p> <pre> import java.util.Scanner; // 1 public class SillyClass2 { // 2 private int num, totalRed, totalBlack; // 3 public SillyClass2 () { // 4 num = 0; // 5 totalRed = 0; // 6 totalBlack = 0; // 7 this.spinWheel(); // 8 System.out.print("Black: " + totalBlack); // 9 System.out.println(" and red: " + totalRed); // 10 } // 11 public void spinWheel () { // 12 Scanner kbd = new Scanner(System.in); // 13 System.out.println("Enter 1 or 0, -1 to quit."); // 14 num = kbd.nextInt(); // 15 </pre>

```

while (num >= 0) { // 16
    if (num == 0) // 17
        totalRed++; // 18
    else if (num == 1) // 19
        totalBlack++; // 20
    else System.out.println("Try again"); // 21
    System.out.println("Enter 1 or 0, -1 to quit."); // 22
    num = kbd.nextInt(); // 23
} // 24
System.out.println("Thanks for playing."); // 25
} // 26
} // 27

```

Which sequence of inputs will cause the body of the while loop **not** to be executed?

A	-1
B	0 -1
C	1 -1
D	0 1 -1
E	0 1 10 -1

Explanation The loop test is `num >= 0`, so if the first number entered is less than 0, the loop will never be executed.

Tags Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-SelectionSubsumesOps, ConceptualComplexity-3-High, TopicSimon-Testing

Field	Value
ID	630784 [created: 2013-06-13 04:18:41, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following class definition:</p> <pre> import java.util.Scanner; // 1 public class SillyClass2 { // 2 private int num, totalRed, totalBlack; // 3 public SillyClass2 () { // 4 num = 0; // 5 totalRed = 0; // 6 totalBlack = 0; // 7 this.spinWheel(); // 8 System.out.print("Black: " + totalBlack); // 9 System.out.println(" and red: " + totalRed); // 10 } // 11 public void spinWheel () { // 12 Scanner kbd = new Scanner(System.in); // 13 System.out.println("Enter 1 or 0, -1 to quit."); // 14 num = kbd.nextInt(); // 15 while (num >= 0) { // 16 if (num == 0) // 17 totalRed++; // 18 else if (num == 1) // 19 totalBlack++; // 20 else System.out.println("Try again"); // 21 System.out.println("Enter 1 or 0, -1 to quit."); // 22 num = kbd.nextInt(); // 23 } // 24 System.out.println("Thanks for playing."); // 25 } // 26 } // 27 </pre> <p>Which sequence of inputs will cause line 18 not to be executed?</p>
A	0 10 -1
B	1 10 -1

C	0 1 -1
D	1 0 10 -1
E	10 1 0 -1
Explanation	Answers A and C are wrong, because the first number entered (0) will cause line 18 to be executed. Answer D is wrong because the first number entered (1) will cause the while loop to be executed, and the second time through the loop, the 0 input will cause line 18 to be executed. Answer E is wrong, because the first input (10) will cause the while loop to be executed, and the third input (0) will cause line 18 to be executed.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-2-Medium, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Testing

Field	Value
ID	630789 [created: 2013-06-13 04:32:33, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following class definition:</p> <pre> import java.util.Scanner; // 1 public class SillyClass2 { // 2 private int num, totalRed, totalBlack; // 3 public SillyClass2 () { // 4 num = 0; // 5 totalRed = 0; // 6 totalBlack = 0; // 7 this.spinWheel(); // 8 System.out.print("Black: " + totalBlack); // 9 System.out.println(" and red: " + totalRed); // 10 } // 11 public void spinWheel () { // 12 Scanner kbd = new Scanner(System.in); // 13 System.out.println("Enter 1 or 0, -1 to quit."); // 14 num = kbd.nextInt(); // 15 while (num >= 0) { // 16 if (num == 0) // 17 totalRed++; // 18 else if (num == 1) // 19 totalBlack++; // 20 else System.out.println("Try again"); // 21 System.out.println("Enter 1 or 0, -1 to quit."); // 22 num = kbd.nextInt(); // 23 } // 24 System.out.println("Thanks for playing."); // 25 } // 26 } // 27 </pre> <p>Which sequence of inputs will cause line 20 not to be executed?</p>
A	0 0 10 -1
B	0 1 10 -1
C	0 10 1 -1
D	1 1 10 -1
E	1 10 1 -1
Explanation	Line A is correct because it is the only answer with no 1 in the sequence of inputs -- an input of 1 is necessary for line 20 to be executed.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-TestProgram, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Testing

Field	Value
ID	630878 [created: 2013-06-13 09:04:06, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	What does the following Java code print:

	<pre> int sum=0; for (int j=0; j<3; j++) { for (int i=0; i<4; i++) { sum += 1; } } System.out.println(sum); </pre>
A	3
B	4
C	6
D	8
E	12
Explanation	With nested loops, the entire inner loop runs to completion one time for each iteration of the outer loop.

Field	Value
ID	630883 [created: 2013-06-13 09:07:39, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int sum=0; for (int i=1; i<=5; i++) { sum += i; } System.out.println(sum); </pre>
A	0
B	5
C	10
D	15
E	The loop is infinte
Explanation	i takes on the values 1 through 5, and each value is added to sum. So the result is 1 + 2 + 3 + 4 + 5, or 15.

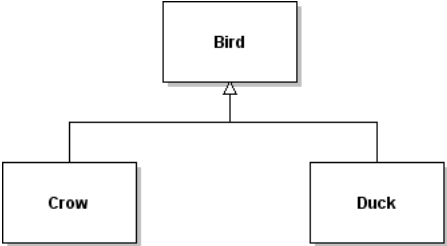
Field	Value
ID	630925 [created: 2013-06-10 09:19:28, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<pre> classDiagram class Vehicle { <<abstract>> +move() +carryCargo() } class Truck { -_weight: int +Truck(int) +Truck() +move() } class OilTanker { -_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class Car { #_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- OilTanker Car PeopleHauler </pre>

Using the information in the UML diagram above, suppose we execute the following Java statements:

```
OilTanker oily = new Truck(2500);
oily.move();
```

which definition of `move` will be executed?

A	The one defined in <code>Truck</code>
B	The one defined in <code>Vehicle</code>
C	The one defined in <code>OilTanker</code>
D	The one defined in <code>PeopleHauler</code>
E	The code will not work
Explanation	The declared type of an object has to be the same as or more abstract than the actual type. It would have been ok to say <code>Truck oily = new OilTanker(2500);</code> since <code>Truck</code> is a superclass of <code>OilTanker</code> , but not vice-versa as in the above code, which will not compile.
Tags	Contributor_Robert_McCartney

Field	Value
ID	631010 [created: 2013-06-13 13:45:45, author: xrobot (xrobot), avg difficulty: 0.0000]
Question	<div><pre>graph BT; Bird < -- Crow; Bird < -- Duck;</pre></div> <p>The simplified UML diagram above shows the relationships among classes Bird, Crow, and Duck that are implemented in Java. Suppose Bird has a <code>fly(Location)</code> method, but we want ducks to fly differently. What is the best way to do this?</p>

D	Make <code>fly(Location)</code> an <code>abstract</code> method in <code>Bird</code> and define a <code>fly(Location)</code> method in <code>Duck</code> .
E	All of the above are equally good answers
Explanation	All of the above answers sort of work, but B is the best -- it allows Duck (and all of Duck's descendents) to have a different fly method without affecting any other classes. A would require invoking duckFly on Ducks to get the appropriate behavior, and fly would give the wrong behavior if invoked on Ducks. C would work, although it doesn't use the built-in method resolution capability of Java and would break down pretty fast if other Bird subclasses fly differently. D would require all subclasses of Bird to define their own fly method (and you could no longer instantiate Bird).
Tags	Contributor_Robert_McCartney

Field	Value
ID	631012 [created: 2013-06-13 13:49:43, author: edwards@cs.vt.edu (xstephen), avg difficulty: 0.0000]
Question	<p>Consider the incomplete code segment below. The segment is supposed to initialize a 4 x 4 matrix as shown in this image:</p> $\begin{bmatrix} 4 & 1 & 0 & 0 \\ 1 & 4 & 1 & 0 \\ 0 & 1 & 4 & 1 \\ 0 & 0 & 1 & 4 \end{bmatrix}$ <pre> final int SIZE = _____; // line 0 int matrix[][] = new int[SIZE][SIZE]; // line 1 for (int i = 0; i < SIZE; i++) // line 2 { for (int j = 0; j < SIZE; j++) // line 3 { if (_____) // line 4 { matrix[i][j] = 4; // line 5 } else if (_____) // line 6 { matrix[i][j] = 1; // line 7 } else { matrix[i][j] = 0; // line 8 } } } </pre> <p>Select statement from the choices below that is the best choice to fill in the blank on line 6 of this code segment so that it behaves as desired.</p>
A	<code>i == j - 1</code>
B	<code>i == j</code>
C	<code>i == j + 1</code>
D	<code>Math.abs(i - j) == 1</code>
E	None of these
Explanation	The condition on line 6 controls which locations in the array are set to the value 1. The 1's in the array should appear along the identity diagonal, where i and j have the same value.
Tags	Nested-Block-Depth-3-three-nested, ATT-Transition-ApplyCode, Contributor_Stephen_Edwards, Skill-Trace_IncludesExpressions, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps

Field	Value
ID	631466 [created: 2013-06-15 10:25:50, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the code</p> <pre> int x = 27; </pre>

	<pre>int y = 12;</pre> <p>the value of the expression <code>x <= y < x + y</code> is:</p>
A	true
B	false
C	1
D	0
E	an error
Explanation	In Java, addition has a higher precedence than the relational operators. So the first step is to plug in the values and compute the results of the addition. Starting with the original expression <code>x <= y < x + y</code> , this yields <code>27 <= 12 < 39</code> . Relational operators are evaluated from left to right in Java, so the next step is to evaluate <code>27 <= 12</code> , which is true. So we now have the expression <code>true < 39</code> , which is invalid.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-DebugCode, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632003 [created: 2013-06-17 16:19:36, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following is a list of syntactically legal Java class names?
A	R2D2, Chameleon, public
B	R2D2, Chameleon, 23skidoo
C	r2d2, chameleon, public
D	r2d2, Iguana, _hello
E	none of the above
Explanation	To compile, Java class names must start with a letter or an underscore, followed by zero or more letters, numbers, or underscores. In addition, a class name must not be one of the Java reserved words, such as <code>public</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-WriteCode_MeansChooseOption, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS1, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632064 [created: 2013-06-17 09:04:36, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider this section of code.</p> <pre>int a = 3, b = 4, c = 5; x = a * b <= c</pre> <p>The expression contains an arithmetic operator, an assignment operator and a relational operator. Which is which?</p>
A	Arithmetic Assignment Relational = * <=
B	Arithmetic Assignment Relational * <= =
C	Arithmetic Assignment Relational <= * =
D	Arithmetic Assignment Relational * = <=

E	Arithmetic Assignment Relational <= = *
Explanation	operators are: multiply, assignment and less than or equal
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-ArithmeticOperators, TopicSimon-Assignment, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, TopicSimon-LogicalOperators

Field	Value
ID	632070 [created: 2013-06-17 08:20:42, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider the following short program:</p> <pre>#include <stdio.h> void f1(void); int a; void main(void) { int b; a = b = 1; f1(); printf("%d %d", a, b); } void f1(void) { int b = 3; a = b; }</pre> <p>A C program can use the same variable name in a number of places, as shown in this example, but it is always possible to work out to which actual variable a particular instance refers. This is described as</p>
A	the rules of assignment
B	block structuring
C	the rules of precedence
D	the data type of a variable
E	the scope of a variable
Explanation	<p>Scope is the largest region of program text in which a name can potentially be used without qualification to refer to an entity; that is, the largest region in which the name potentially is valid. Broadly speaking, scope is the general context used to differentiate the meanings of entity names. The rules for scope combined with those for name resolution enable the compiler to determine whether a reference to an identifier is legal at a given point in a file.</p> <p>The scope of a declaration and the visibility of an identifier are related but distinct concepts. Scope is the mechanism by which it is possible to limit the visibility of declarations in a program. The visibility of an identifier is the region of program text from which the object associated with the identifier can be legally accessed. Scope can exceed visibility, but visibility cannot exceed scope. Scope exceeds visibility when a duplicate identifier is used in an inner declarative region, thereby hiding the object declared in the outer declarative region. The original identifier cannot be used to access the first object until the scope of the duplicate identifier (the lifetime of the second object) has ended.</p> <p>Source http://publib.boulder.ibm.com/infocenter/lnxpcomp/v8v101/index.jsp?topic=%2Fcom.ibm.xlcpp8l.doc%2Flanguage%2Fref%2Fzscope_c.htm</p>
Tags	Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Horizontal-2-Struct_Control, Block-Vertical-3-Relations, Language-C, Bloom-2-Comprehension, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, TopicSimon-Scope-Visibility

Field	Value
ID	632071 [created: 2013-06-16 23:53:05, author: tclear (xtony), avg difficulty: 0.0000]
Question	What is the correct way to declare pFile as a file pointer?
A	FILE *pFile;

B	FILE pFile*;
C	*FILE pFile;
D	*pFile FILE;
E	pFile *FILE;
Explanation	<p>FILE *</p> <p>For C File I/O you need to use a FILE pointer, which will let the program keep track of the file being accessed. (You can think of it as the memory address of the file or the location of the file).</p> <p>Source http://www.cprogramming.com/tutorial/cfileio.html</p> <p>For other examples also refer http://stackoverflow.com/questions/589389/what-is-the-correct-way-to-declare-and-use-a-file-pointer-in-c-c</p>
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, TopicSimon-FileIO, CS1, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low

Field	Value
ID	632074 [created: 2013-06-16 23:44:57, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What will be displayed by</p> <pre>static char szName[] = "Peter"; printf("%d", strcmp("Peter", szName));</pre>
A	A negative number such as -1
B	0
C	A positive number such as 1
D	5
E	Nothing - it gives a syntax error and will not compile.
Explanation	<p>DescriptionThe C library function <code>int strcmp(const char *str1, const char *str2)</code> compares the string pointed to by <code>str1</code> to the string pointed to by <code>str2</code>.</p> <p>DeclarationFollowing is the declaration for <code>strcmp()</code> function.</p> <pre>int strcmp(constchar*str1,constchar*str2)Parametersstr1 -- This is the first string to be compared. str2 -- This is the second string to be compared. Return ValueThis function returned values are as follows: if Return value if < 0 then it indicates str1 is less than str2 if Return value if > 0 then it indicates str2 is less than str1 if Return value if = 0 then it indicates str1 is equal to str2 As the strings "Peter" are equal in this instance the value returned is 0 source: http://www.tutorialspoint.com/c_standard_library/c_function_strcmp.htm</pre>
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, TopicSimon-Strings

Field	Value
ID	632077 [created: 2013-06-16 23:05:02, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider the following short program, which does not meet all institutional coding standards:</p> <pre>void vCodeString(char szText[]); /* First line */ #include <stdio.h> #include <string.h> #define MAX_LEN 12 int main(void) {</pre>

	<pre> char szData[MAX_LEN]; printf("Enter some text to code: "); scanf("%s", szData); vCodeString(szData); /* Line 8 */ printf("Coded string is %s\n", szData); } void vCodeString(char szText[]) { int i = -1; while(szText[++i]) { szText[i] += (char)2; } } </pre> <p>Knowing that scanf does not read beyond a space in the input, I try the routine by typing in Hello there when it asks me for some text. What is output after "Coded string is "?</p>
A	Nothing
B	Hello
C	Hello there
D	Jgnnq vjgtg
E	Jgnnq
Explanation	The vCodeString function converts the input by incrementing the next two alphabetical letters for each character passed to it from the szData array containing the the "hello" substring after which the scanf function had halted on meeting the delimiting space character
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-3-Relations, Language-C, TopicSimon-FileIO, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings

Field	Value
ID	632079 [created: 2013-06-16 16:58:09, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider the following short program, which does not meet all institutional coding standards:</p> <pre> void vCodeString(char szText[]); /* First line */ #include <stdio.h> #include <string.h> #define MAX_LEN 12 int main(void) { char szData[MAX_LEN]; printf("Enter some text to code: "); scanf("%s", szData); vCodeString(szData); /* Line 8 */ printf("Coded string is %s\n", szData); } void vCodeString(char szText[]) { int i = -1; while(szText[++i]) { </pre>

	<pre> szText[i] += (char)2; } } </pre> <p>Why is there no address operator (&) before szData in the scanf line?:</p>
A	Parameters are passed to scanf by value, not by reference.
B	scanf takes only inward parameters so does not need the &
C	szData is the address of the array.
D	szData is an array so it does not have an address.
E	Variables of type char cannot use the address operator.
Explanation	On declaration of a variable a space in memory is reserved for its storage. Here szData is an array of type char which has already been defined in the program and a memory location has been allocated to it
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-1-Knowledge, TopicSimon-FileIO, CS1, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632080 [created: 2013-06-16 16:45:21, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider the following short program, which does not meet all institutional coding standards:</p> <pre> void vCodeString(char szText[]); /* First line */ #include <stdio.h> #include <string.h> #define MAX_LEN 12 int main(void) { char szData[MAX_LEN]; printf("Enter some text to code: "); scanf("%s", szData); vCodeString(szData); /* Line 8 */ printf("Coded string is %s\n", szData); } void vCodeString(char szText[]) { int i = -1; while(szText[++i]) { szText[i] += (char)2; } } </pre> <p>The first line is:</p>
A	an array declaration
B	a macro definition
C	a function call
D	a function definition
E	a function prototype
Explanation	A function prototype or function interface in C, Perl, PHP or C++ is a declaration of a function that omits the function body but does specify the function's return

	type, name, arity and argument types. While a function definition specifies what a function does, a function prototype can be thought of as specifying its interface. [Source "Function prototype" Wikipedia]. Note the function is called from Main at line 8 and defined at line 11.
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632085 [created: 2013-06-15 19:21:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be printed by this code?</p> <pre> public static void main(String [] args) { int number = 6; int secondNumber = changeNumber (number); System.out.print(number + " " + secondNumber); } public static int changeNumber(int number) { number = 12; return number; } </pre>
A	6 6
B	6 12
C	12 6
D	12 12

Field	Value
ID	632091 [created: 2013-06-17 20:30:59, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be written in the gaps from top to bottom and left to right respectively to create a correct program.</p> <pre> public static void main(String [] args){ double n1 = 1.5; double n2 = 2; returnValue = compute (n1 , n2); System.out.print(returnValue); } public static compute (..... a , b){ return (int) (a+b); } </pre>
A	int int double double
B	double int double double
C	int int double int
D	double int double int

Field	Value
ID	632092 [created: 2013-06-14 23:46:14, author: tclear (xtony), avg difficulty: 0.0000]
Question	"The value when iVal is divided by 10" would be coded as:
A	iVal % 10

B	iVal & 10
C	iVal == 10
D	iVal / 10
E	iVal 10
Explanation	Expresses the value of a variable using the division operator and the divisor (here 10)
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	631999 [created: 2013-06-17 16:08:11, author: kate (xkate), avg difficulty: 0.0000]
Question	Which of the following assertions about methods is correct?
A	The body of a method must contain at least one return statement.
B	A method must return a value.
C	A method invocation must contain at least one argument.
D	A method with no return statement must not be invoked on the right side of an assignment statement.
E	None of the above.
Explanation	(a) and (b) are true of functions, but not of Java methods in general. (c) is incorrect. Methods in general and functions specifically can be written with or without parameters. (d) is correct: methods without a return statement can't be on the right-hand side of an assignment statement, because they don't have a value. And if (d) is correct, (e) must be wrong.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-NotApplicable, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631950 [created: 2013-06-17 12:45:43, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the input "Click & Clack", what is the output of line 16 of the following Java code?</p> <pre> System.out.println("Enter a string: "); String input = kbd.nextLine(); String a = ""; String letter = ""; int d = 0; int r = 1; String englishAlphabet = "abcdefghijklmnopqrstuvwxyz"; for (int i = 0; i < englishAlphabet.length(); i++) { letter = englishAlphabet.substring(i,i+1); if (input.contains(letter)){ a = letter + a; } else { d++; } } System.out.println("String a is: " + a); //line 16 System.out.println("int d is: " + d); // line 17 </pre> <p><input type="text"/></p>
A	ClickClack
B	kcalkcil
C	acikl
D	lkica
E	None of the above.

Explanation	This code checks all the letters in the lower-case alphabet to see which ones appear in the input, and concatenates them into a string where each letter appears once, in reverse alphabetical order. The resulting string is output in line 16.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-LoopsSubsumesOperators, CSother, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Strings

Field	Value
ID	631539 [created: 2013-05-28 19:45:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What should be done to initialize <i>counter</i> to one in <i>main</i> method?</p> <pre> class C { private int counter; } public class F { public static void main(String arg[]){ } } </pre>
A	<code>c.counter = 1;</code>
B	<code>C c = new C();</code> <code>c.counter = 1;</code>
C	<p>C. add the following to C:</p> <pre> public void setCounter(int c){ counter = c; } </pre> <p>Add the following to F:</p> <pre> C c = new C(); c.setCounter(1); </pre>
D	<p>Change the definition of counter as follow:</p> <pre> private int counter = 1; </pre>
Explanation	Note: This question ask you t initialize the varibale in <i>main</i> method.

Field	Value
ID	631874 [created: 2013-06-17 07:16:32, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the code:</p> <pre> if (x >= 0) System.out.println("1"); else if (x < 20) System.out.println("2"); else System.out.println("3"); System.out.println("4"); </pre> <p>for what integer values of x will 3 be among the values printed?</p>
A	<code>x < 0</code>
B	<code>x >= 0</code>
C	<code>x < 20</code>

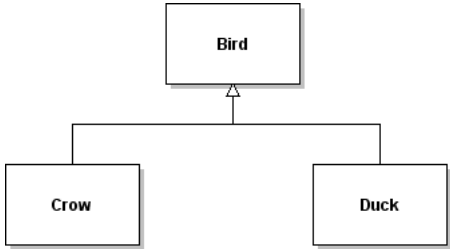
D	All values of x
E	None of the above.
Explanation	The if-condition is true for all values of $x \geq 0$; the if-else condition is true for all values of $x < 0$. So that doesn't leave any possible values for the else-clause.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-1

Field	Value
ID	631875 [created: 2013-06-17 07:20:58, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Given the code:</p> <pre> if (x >= 0) System.out.println("1"); else if (x < 20) System.out.println("2"); else System.out.println("3"); System.out.println("4"); </pre> <p>for what integer values of x will <input type="text" value="4"/> be among the values printed?</p>
A	$x < 0$
B	$x \geq 0$
C	$x \geq 20$
D	All values of x
E	None of the above.
Explanation	The final <code>println</code> statement is outside the conditional, so it is printed whatever the value of <code>x</code> is.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-1

Field	Value
ID	631876 [created: 2013-06-17 07:35:30, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>After the assignments <code>a = true</code> and <code>b = true</code>, what is returned by</p> <pre> (! a b) && (a ! b) </pre> <p>?</p>
A	true
B	false
C	1
D	0
E	An error.
Explanation	<p>Substituting the assigned values for a and b (both true) into the original expression</p> <pre> (! a b) && (a ! b) </pre> <p>we get</p> <pre> (! true true) && (true ! true) </pre> <p>In Java, evaluating what's inside the parentheses has higher precedence than any of the other operators here. Inside the parentheses, logical not (!) takes precedence over logical or (). Evaluating the not's first, we get</p>

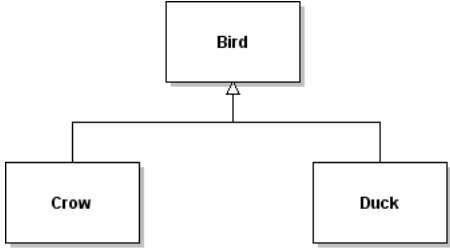
	<pre>(false true) && (true false)</pre> <p>Next, evaluate the or's, and we get:</p> <pre>true && true</pre> <p>which gives us</p> <pre>true</pre>
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS1, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-SelectionSubsumesOps, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	631877 [created: 2013-06-17 07:57:35, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>What is the value of the expression</p> <pre>"J R R Tolkien".compareTo("J K Rowling") < 0</pre>
A	True
B	False
C	"J R R Tolkien"
D	An error.
E	None of the above.
Explanation	The <code>compareTo</code> method when called on a <code>String</code> object with a <code>String</code> parameter, returns <code>true</code> if the first <code>String</code> is before the second in alphabetical order. Otherwise it returns <code>false</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CSOther, CodeLength-lines-00-to-06_Low, TopicSimon-RelationalOperators, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	631878 [created: 2013-06-17 08:02:11, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	 <p>The simplified UML diagram above shows the relationships among classes Bird, Crow, and Duck.</p> <p>Suppose Russell is an instance of Crow and Howard is an instance of Duck.</p> <p>Which of the following is incorrect?</p>
A	Howard is an instance of Bird
B	Crow is an instance of Bird
C	Russell has the capabilities and attributes of a Bird
D	Bird is the superclass of Duck
E	All Bird attributes are shared by Russell and Howard
Explanation	A useful way to look at classes and instances is to use sets: a class describes a set of instances that share the same attributes and capabilities, and instantiating from a set produces a member of that set. From this perspective, a class's superclass is a superset of that class, defined by attributes and capabilities that are subsets of those of the class. So: all instances of a class are instances of all of its class's ancestors, and all instances of a class share the attributes and capabilities of that class. So all but B are correct; B is incorrect because Crow is not an instance.

Tags	Contributor_Robert_McCartney
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Field	Value
ID	631879 [created: 2013-06-17 08:04:32, author: kate (xkate), avg difficulty: 0.0000]
Question	What is the value of the expression <pre>"J".compareTo("J K Rowling") < 0</pre>
A	true
B	false
C	"J"
D	an error
E	none of the above
Explanation	The <code>compareTo</code> method when called on a <code>String</code> object with a <code>String</code> parameter, returns <code>true</code> if the first <code>String</code> is before the second in alphabetical order. Otherwise it returns <code>false</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CSother, CodeLength-lines-00-to-06_Low, TopicSimon-RelationalOperators, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	631880 [created: 2013-06-17 08:10:45, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	 <pre> classDiagram Bird < -- Crow Bird < -- Duck </pre> <p>The simplified UML diagram above shows the relationships among Java classes Bird, Crow, and Duck.</p> <p>Suppose Russell is an instance of Crow and Howard is an instance of Duck.</p> <p>Which of the following is not necessarily true?</p>
A	Howard and Russell have different capabilities
B	Crows and Ducks inherit from Birds
C	Crow is a subclass of Bird
D	Bird is a superclass of Duck
E	Bird is more general than Duck
Explanation	Howard and Russell are instances of different classes (Duck and Crow), each of which is a subclass of Bird. If neither Crow nor Duck define any methods, then Howard and Russell will have the same methods (i.e. capabilities) as Bird.
Tags	Contributor_Robert_McCartney

Field	Value
ID	631929 [created: 2013-06-17 11:02:17, author: kate (xkate), avg difficulty: 0.0000]
Question	After the assignment statement <pre>String word = "entropy";</pre> what is returned by <pre>word.substring(2);</pre> <p>?</p>

A	"en"
B	"tropy"
C	"entropy"
D	An error
E	None of the above
Explanation	<code>word.substring(n)</code> returns the substring of <code>word</code> that starts at index n and ends at the end of the <code>String</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CSother, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	631931 [created: 2013-06-17 11:20:28, author: kate (xkate), avg difficulty: 0.0000]
Question	After the assignment statement <pre>String word = "entropy";</pre> what is returned by <pre>word.substring(-1);</pre>
A	"e"
B	"entropy"
C	the empty String
D	an error
E	none of the above
Explanation	When this code is executed, it throws a <code>StringIndexOutOfBoundsException</code> exception.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CSother, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops, TopicSimon-Strings

Field	Value
ID	631949 [created: 2013-06-17 12:52:17, author: kate (xkate), avg difficulty: 0.0000]
Question	Given the input "Click & Clack", what is the output of line 17 of the following Java code? <pre> System.out.println("Enter a string: "); String input = kbd.nextLine(); String a = ""; String letter = ""; int d = 0; int r = 1; String englishAlphabet = "abcdefghijklmnopqrstuvwxyz"; for (int i = 0; i < englishAlphabet.length(); i++) { letter = englishAlphabet.substring(i,i+1); if (input.contains(letter)){ a = letter + a; } else { d++; } } System.out.println("String a is: " + a); //line 16 System.out.println("int d is: " + d); // line 17 </pre>
A	16
B	18
C	21

D	22
E	None of the above.
Explanation	d contains a count of the number of lower-case letters that do *not* appear in the input string. Since there are 5 letters that do appear, the answer is 26-5 or 21.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-LoopsSubsumesOperators, CSOther, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Strings

Field	Value
ID	632093 [created: 2013-06-17 20:32:45, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Fill in the gap to create a correct program.</p> <pre> public static void main(String [] args){ final int firstDim = 2; final int secondDim = 3; read(firstDim, secondDim); } public static _____ read (int dim1, int dim2){ int [][] array = new int[dim1][dim2]; Scanner sc = new Scanner(System.in); for (int i = 0; i < dim1; i++) for (int j = 0; j < dim2; j++) array[i][j] = sc.nextInt(); return array; } </pre>
A	void
B	int
C	int []
D	int[][]

Field	Value
ID	629957 [created: 2013-06-11 10:33:14, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you have a Java array of <code>int</code> s. Which of the following operations can be performed in constant ($O(1)$) time? (Circle all correct answers.)
A	Insert a number at a given position.
B	Retrieve a number from a given position
C	Print out the numbers in the array
D	Compute the sum of all the numbers in the array
E	Sort the numbers in the array
Explanation	<p>Note: Only one answer can be marked as correct here, but both A and B are correct.</p> <p>Note 2: We need a new tag <code>SkillAnalyze-Code</code> for this kind of thing.</p> <p>C is incorrect because printing out all the numbers takes $O(n)$ time.</p> <p>D is incorrect because computing the sum of the numbers also takes $O(n)$ time.</p> <p>E is incorrect because while hashtables come close on average, in the worst case, sorting is not $O(1)$.</p> <p>A is correct (assuming you don't have to move any of the numbers that are already in the array).</p> <p>B is correct.</p>
Tags	Contributor_Kate_Sanders, Skill-AAA-XXXXXXXXXXXXXXXXXXXXXXXXXXXX, ATT-Transition-DefineCSspeak, ATT-Type-How, Difficulty-2-Medium, Block-

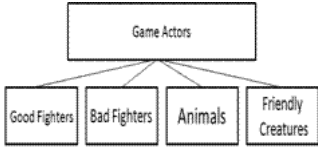
Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, MultipleAnswers-See-Explanation, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	617596 [created: 2013-05-20 22:28:34, author: tclear (xtony), avg difficulty: 0.0000]
Question	Which response best explains in plain English what this segment of code does? <pre>int a = 10; int b = 8; int c = 0; c = (a + b)/2</pre>
A	Calculates half the sum of two numbers
B	Calculates the average of two numbers
C	Swaps the values of a and b
D	demonstrates the use of the assignment statement
E	Converts an integer value to double
Explanation	This answer gives the most generalised explanation for the purpose of the code segment (namely to calculate the average of two numbers)

Field	Value
ID	618574 [created: 2013-05-28 20:35:55, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What is wrong with this code? <pre>interface A{ abstract double aMethod(); } interface B{ abstract int aMethod(); } class testInterface implements A, B{ }</pre>
A	A class cannot implement more than one interface.
B	Both the interfaces have a method with the same name and different return type.
C	Methods defined in an interface should not be abstract.
D	aMethod should be overridden in testInterface class.

Field	Value
ID	618576 [created: 2013-05-28 20:37:04, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which one of the options cannot be a choice to override the aMethod in class testInterface? <pre>interface A{ abstract Object aMethod(); } interface B{ abstract Object aMethod(); } class testInterface implements A, B{</pre>

	}
A	public String aMethod(){ return "";}
B	public Object aMethod(){ return null;}
C	public Double aMethod(){ return 0.0;}
D	public int aMethod(){ return 0;}

Field	Value
ID	618578 [created: 2013-05-28 20:41:06, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What would be the most effective way of adding useGun() method to this structure. Note: useGun() can only be used for any type of fighters.</p>  <pre> classDiagram class GameActors class GoodFighters class BadFighters class Animals class FriendlyCreatures GameActors < -- GoodFighters GameActors < -- BadFighters GameActors < -- Animals GameActors < -- FriendlyCreatures </pre>
A	Add useGun() to GameActors class.
B	Add useGun() to GameActors class and make this class abstract.
C	Add useGun() to both GoodFighters and BadFighters class.
D	Define an interface and add useGun() to this interface and let fighters to implement the interface.

Field	Value
ID	618579 [created: 2013-05-28 20:41:58, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which statement produces a compilation error?
A	class A extends M implements I { // code was removed } class B extends N implements I { // code was removed }
B	class A extends M implements I, L, J { // code was removed }
C	class A extends M, N implements I { // code was removed }
D	class A extends M implements I { // code was removed }

Field	Value
ID	618585 [created: 2013-05-28 20:45:47, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which of the following choices cannot be another constructor for academic class?</p> <pre> class personnel{ String name, ID; char qualificationCode; public personnel(String n, String i, char q){ name = n; > qualificationCode = q; } </pre>

	<pre> public personnel (){ name = null; > qualificationCode = ' '; } } class academic extends personnel{ int teachingHours; public academic(String n, String i, char q, int t){ super(n,i,q); teachingHours = t; } public academic(int t){ super(null, null, ' '); teachingHours = t; } } </pre>
A	<pre> public academic(){ super(null, null, ' '); this (0); } </pre>
B	<pre> public academic(){ this (null, null, ' ', 0); } </pre>
C	<pre> public academic(){ name = null; > qualificationCode = ' '; teachingHours = 0; } </pre>
D	<pre> public academic(){ super(null, null, ' '); teachingHours = 0; } </pre>

Field	Value
ID	618592 [created: 2013-05-28 20:49:07, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Where in this code a compiler error is reported and why?</p> <pre> 1 class pen{ 2 char colorCode; 3 } 4 public class penCounter { 5 public static void main(String[] arg){ 6 int numberOfPen; 7 pen myPen = new pen(); </pre>

	<pre> 8 System.out.println(myPen.colorCode + numberOfPen); 9 } 10} </pre>
A	line 8, numberOfPen has not been initialized.
B	line 8, colorCode has not been initialized.
C	line 6, numberOfPen has not been initialized.
D	line 2, colorCode has not been initialized.

Field	Value
ID	618596 [created: 2013-05-28 20:50:30, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be the outputted?</p> <pre> class A{ int firstMethod(int input){ return input*2; } } class B extends A{ int firstMethod(int input){ super.firstMethod(input); return input*2; } } class C extends B{ int firstMethod(int input){ return super.firstMethod(input)* 2; } } public class test { public static void main(String[] arg){ C myObject = new C(); System.out.println(myObject.firstMethod(2)); } } </pre>
A	4
B	8
C	16
D	32

Field	Value
ID	618600 [created: 2013-05-28 20:52:03, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be outputted?</p> <pre> class A{ int firstMethod(int input){ return input+2; } } </pre>

	<pre> } } class B extends A{ } class C extends B{ int firstMethod(int input){ return input-2; } } public class test { public static void main(String[] arg){ B myObject = new B(); System.out.println(myObject.firstMethod(2)); } } </pre>
A	0
B	2
C	4
D	Compiler Error

Field	Value
ID	618601 [created: 2013-05-28 20:52:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which sentence is NOT correct?
A	If a class has no constructor, it cannot be extended.
B	If a class has only private constructors, it cannot be extended.
C	If a class is final, it cannot be extended.
D	If a class is public, it is extendable anywhere.

Field	Value
ID	618604 [created: 2013-05-28 20:53:56, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which part of the following code will produce a compiler error if we know class cat extends a class called animal and both of the classes have a method called makeNoise and class cat has a method called showFood.</p> <pre> 1 animal mydog = new animal(); 2 mydog.makeNoise(); 3 animal mycat = new cat(); 4 mycat.makeNoise(); 5 mycat.showFood(); </pre>
A	line 3, new cat should be changed to new animal.
B	line 3, animal should be changed to cat.
C	line 4, makeNoise has not been recognized by mycat
D	line 5, showFood has not been recognized by mycat

Field	Value
ID	618606 [created: 2013-05-28 20:54:59, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which on these four following definitions is not allowed?</p> <pre> abstract class first{ void firstMethod(){} } abstract class second{ abstract void secondMethod(); } class third { abstract void thirdMethod(); } class fourth{ void fourthMethod(){} } </pre>
A	first
B	second
C	third
D	fourth

Field	Value
ID	618572 [created: 2013-05-28 20:34:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which option is NOT an alternative solution for the bug that exists in this code?</p> <pre> class shape{ float area; public shape(float a){ area = a; } } class square extends shape{ float side; public square (float s){ side = s; } } </pre>
A	<i>square</i> constructor should call a super constructor explicitly.
B	Class <i>shape</i> must have a null constructor.
C	class <i>square</i> should have a null constructor.
D	shape constructor should be removed.

Field	Value
ID	618568 [created: 2013-05-28 20:32:48, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Considering the following code, which of the choices are wrong when access to ID is desired?</p> <pre> class N{ </pre>

	<pre> private int ID; public void setID(int id){ > } public int getID(){ return ID; } } </pre>
A	<p>if we had the following in class N</p> <pre> N n = new N(); System.out.print(n.ID); </pre>
B	<p>If we had the following in another class but the same package as N</p> <pre> N n = new N(); System.out.print(n.ID); </pre>
C	<p>If we had the following in class N</p> <pre> System.out.print(ID); </pre>
D	<p>If we had the following in another class but the same package as N</p> <pre> N n = new N(); System.out.print(n.getID()); </pre>

Field	Value
ID	617785 [created: 2013-05-20 05:33:25, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be printed?</p> <pre> class A{ protected void A_Method(){ System.out.println ("This is the first A_Method"); } } class B extends A{ protected void A_Method(){ System.out.print ("This is the second A_Method"); } } class C extends B{ protected void A_Method(){ System.out.print ("This is the third A_Method"); } } public class test { public static void main(String[] args){ A [] objects = new A[3]; objects[0]= new A(); objects[1]= new B(); objects[2]= new C(); objects[1].A_Method(); </pre>

	<pre> } } </pre>
A	This is the first A_Method
B	This is the second A_Method
C	This is the third A_Method
D	Nothing, this is an error.
Explanation	Java remembers which object (subtype) has been inserted into the array because of polymorphism.

Field	Value
ID	618479 [created: 2013-05-28 19:38:21, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What is wrong with this code?</p> <pre> final class A{ } class B extends A{ } </pre>
A	Class B is not public.
B	Class A is not public.
C	A final class cannot be extended.
D	There are no instance variables and methods defined for these classes.

Field	Value
ID	618496 [created: 2013-05-28 19:49:48, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>How many object references will be created after initializing the following array?</p> <pre>String [][] names = new String [3][2];</pre>
A	3
B	2
C	6
D	7

Field	Value
ID	618502 [created: 2013-05-28 19:54:53, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What would be outputted?</p> <pre>String s_1 = "Hello"; String s_2 = "World"; System.out.format("%-7S %7s", s_1,s_2);</pre>
A	Hello World
B	HELLO World
C	Hello World
D	HELLO World

Field	Value
ID	618506 [created: 2013-05-28 19:57:13, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	How many times the capacity of the vector in following code changes? <pre>Vector<Integer> intVect = new Vector<Integer>(10,2); for (int i = 0; i <40; i++) intVect.add(i);</pre>
A	2
B	5
C	15
D	30

Field	Value
ID	618507 [created: 2013-05-28 19:58:12, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	In a program 5 objects are created initially and inserted into a vector. These objects increase to 64 during the execution of the program. Each time 8 objects is added to the vector except the last time in which 3 objects is added. Which of the following definition results in better performance in terms of execution time and allocated space at the end?
A	<code>Vector<Object> objectVect = new Vector<Object>(5,8);</code>
B	<code>Vector<Object> objectVect = new Vector<Object>(8);</code>
C	<code>Vector<Object> objectVect = new Vector<Object>(8,5);</code>
D	<code>Vector<Object> objectVect = new Vector<Object>(5);</code>

Field	Value
ID	618517 [created: 2013-05-28 20:02:06, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which of the following variables are object references? <pre>public class firstClass { double[] doubleArray = {2.3, 3.4}; public static void main(String[] args) { int width = 250; Color col = new Color(88,34,200); } }</pre>
A	doubleArray, col
B	width, doubleArray
C	col, width
D	col, width, doubleArray

Field	Value
ID	618543 [created: 2013-05-28 20:21:35, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What change should be made to correct the code? <pre>String returnValue = ""; try { BufferedReader d = new BufferedReader(new InputStreamReader(System.in)); String userInput = new String(d.readLine());</pre>

	<pre> returnValue = userInput; } </pre>
A	Need to insert <i>finally</i> .
B	Need to insert <i>catch</i> .
C	Need to insert <i>finally</i> or <i>catch</i> .
D	Need to remove <i>try</i> .

Field	Value
ID	618549 [created: 2013-05-28 20:24:33, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What would you put in the blank areas to let the following code read some integer data from console?</p> <pre> Scanner sc = new Scanner(_____); int intValue ; while ((intValue = _____) != -1) System.out.println(intValue); </pre>
A	System.in , sc.nextInt()
B	nothing, leave it blank , sc.nextInt()
C	nothing, leave it blank , sc.hasNextInt()
D	System.in , sc.hasNextInt()

Field	Value
ID	618554 [created: 2013-05-28 20:25:53, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be printed by the following code if in.txt includes two sentences which have been inserted in two separate lines?</p> <pre> try { inputStream = new FileReader("in.txt"); int c; while ((c = inputStream.read()) != -1) System.out.println((char)c); } finally { if (inputStream != null) inputStream.close(); } </pre>
A	A sequence of integers that represents the unicode of characters that form the text.
B	A sequence of characters that form the text.
C	The first line in in.txt.
D	The whole text in in.txt.

Field	Value
ID	618558 [created: 2013-05-28 20:28:17, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be outputted?</p> <pre> String input = "Home is where the heart is"; Scanner sc_input = new Scanner(input).useDelimiter("\\s*is\\s*"); while (sc_input.hasNext()) </pre>

	System.out.println(sc_input.next());
A	Home is where the heart is
B	Home is Where the heart is
C	Home where the heart
D	Home where the heart

Field	Value
ID	618612 [created: 2013-05-28 20:57:07, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be the output?</p> <pre> class Pen{ float hight; public Pen(){ hight = 0; } public Pen (float h){ hight = h; } } class Pencil extends Pen{ String type; public Pencil(){ type = null; } public Pencil (String t){ type = t; } } public class test { public static void main(String[] arg){ Pen mypen = new Pen(10); System.out.print(mypen.hight+ " "); Pencil mypencil = new Pencil("HB"); System.out.println(mypencil.hight + " "+ mypencil.type); </pre>

	<pre> } } </pre>
A	10.0 0.0 HB
B	10.0 10.0 HB
C	A compiler error
D	A runtime error

Field	Value
ID	618617 [created: 2013-05-28 20:59:12, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be the output?</p> <pre> class Pen{ float hight; public Pen (float h){ hight = h; } } class Pencil extends Pen{ String type; public Pencil(){ type = null; } public Pencil (String t){ type = t; } } public class test { public static void main(String[] arg){ Pen mypen = new Pen(10); System.out.print(mypen.hight+ " "); Pencil mypencil = new Pencil("HB"); System.out.println(mypencil.hight + " "+ mypencil.type); } } </pre>
A	10.0 0.0 HB
B	10.0 10.0 HB
C	A compiler error
D	A runtime error

Field	Value
ID	618630 [created: 2013-05-28 21:05:59, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which option is NOT a correct solution to handle an exception if we know that NumberException is a user defined exception?
A	<pre> public static int testNumber(int x) throws NumberException{ if (x >= 12) </pre>

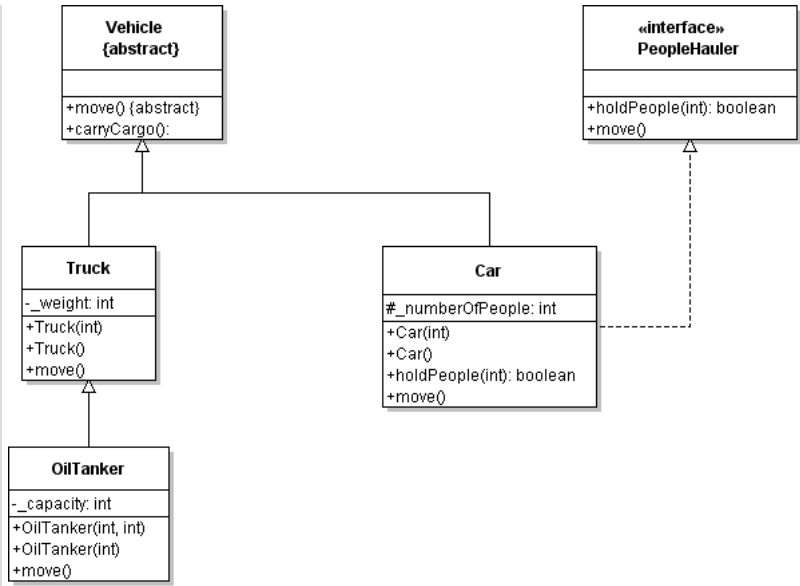
	<pre> throw new NumberException("This is my created exception message"); return x; } </pre>
B	<pre> public static int testNumber(int x) throws NumberException{ try{ if (x >= 12) throw new NumberException("This is my created exception message"); } finally{} return x; } </pre>
C	<pre> public static int testNumber(int x) throws NumberException{ try{ if (x >= 12) new NumberException(); } catch (NumberException e){ e.printStackTrace(); } finally{} return x; } </pre>
D	<pre> public static int testNumber(int x) { try{ if (x >= 12) throw new NumberException(); } catch (NumberException e){ e.printStackTrace(); } finally{} return x; } </pre>

Field	Value
ID	627690 [created: 2013-05-28 11:10:12, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>2. Consider the following class definition:</p> <pre> public class SillyTestClass { public SillyTestClass(int x, int y) { System.out.println(y); } public SillyTestClass(String string1, String string2) { System.out.println(string2); } public static void main (String [] args) { SillyTestClass app = new SillyTestClass(20, "Try this!"); } } </pre> <p>Which of the following is the most accurate statement about this code?</p>
A	The class definition won't compile, because it has two constructors.

B	The class definition won't compile, because two constructors have the same number of parameters.
C	The class definition won't compile, because the actual and formal parameter types don't match.
D	It will compile, and the output when the <code>main</code> method is executed will be: 20
E	It will compile, and the output when the <code>main</code> method is executed will be: Try this!
Explanation	Answer A is wrong because Java programs can have more than one constructor. Answer B is wrong because a variation between the type of the parameters is also sufficient. Answers D and E are wrong because the program won't compile or execute. Answer C identifies the problem.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-DebugCode, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	627757 [created: 2013-06-07 09:02:27, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>The code fragment given above was intended to read values until a negative value was read and then to print the product of the positive values read. Unfortunately, it does not work.</p> <pre> 1. Scanner kbd = new Scanner(System.in); 2. int x, product; 3. product = 0; 4. x = kbd.nextInt(); 5. while (x >= 0) { 6. if (x > 0) { 7. product *= x; 8. } 9. x = kbd.nextInt(); 10. } 11. System.out.println(product); </pre> <p>Which of the following best describes the error that prevents the code from computing the correct answer?</p>
A	Variable <code>x</code> is not initialized correctly.
B	Variable <code>product</code> is not initialized correctly.
C	The loop is executed one too many times.
D	The loop is executed one two few times.
E	None of the above.
Explanation	Because the variable <code>product</code> is initialized to 0 instead of 1, the answer will always be 0.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-DebugCode, ATT-Type-How, Difficulty-2-Medium, TopicSimon-ArithmeticOperators, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	629589 [created: 2013-06-10 08:16:57, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	



Using the information in the above UML diagram, if `sporty` is an instance of `Car`, what gets called if you execute `sporty.move()` ?

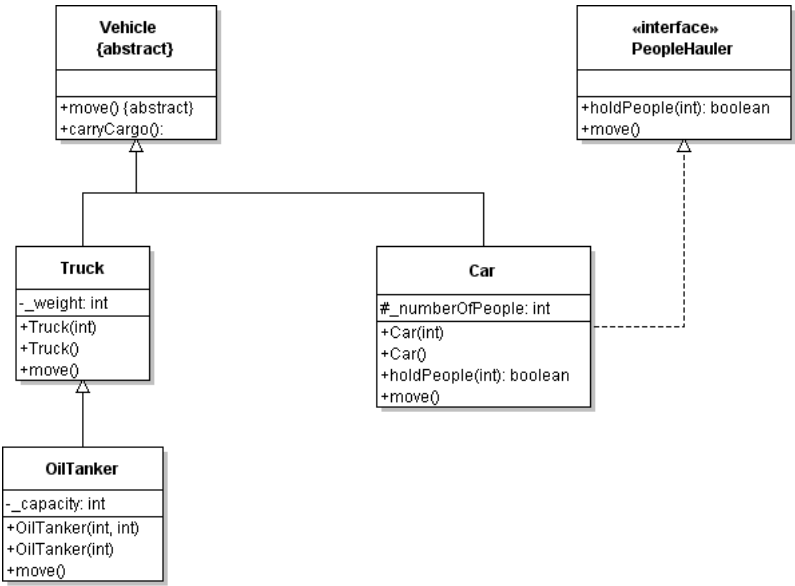
A	The <code>move</code> method defined in <code>Vehicle</code>
B	The <code>move</code> method defined in <code>PeopleHauler</code>
C	The <code>move</code> method defined in <code>Car</code>
D	All of the above
E	None of the above
Explanation	Since the diagram indicates that there is a <code>move</code> method defined in <code>Car</code> , and <code>sporty</code> is an instance of <code>Car</code> , then that one is the one executed.

Field	Value				
ID	629591 [created: 2013-06-10 08:23:47, author: xrobert (xrobert), avg difficulty: 0.0000]				
Question	<div><div><pre>classDiagram class Vehicle { <<abstract>> +move()* +carryCargo() } class Truck { -_weight: int +Truck(int) +Truck() +move() } class Car { #_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class OilTanker { -_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- Car Truck < -- OilTanker Car .. > PeopleHauler</pre></div><p>Using the information in the UML diagram above, suppose the <code>move</code> method of <code>OilTanker</code> has the line <code>super.move()</code>. Which <code>move</code> method does that refer to?</p></div> <div><table><tr><td>A</td><td>The <code>move</code> method defined in <code>Vehicle</code></td></tr><tr><td>B</td><td>The <code>move</code> method defined in <code>PeopleHauler</code></td></tr></table></div>	A	The <code>move</code> method defined in <code>Vehicle</code>	B	The <code>move</code> method defined in <code>PeopleHauler</code>
A	The <code>move</code> method defined in <code>Vehicle</code>				
B	The <code>move</code> method defined in <code>PeopleHauler</code>				

C	The <code>move</code> method defined in <code>Car</code>
D	All of the above
E	None of the above
Explanation	<code>super.move()</code> in <code>OilTanker</code> refers to the <code>move</code> method that would be found starting from its superclass, which is <code>Truck</code> , which is not given as an option.

Field	Value
ID	629596 [created: 2013-06-10 08:48:19, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<div><pre>classDiagram class Vehicle { <<abstract>> +move()* +carryCargo() } class Truck { -_weight: int +Truck(int) +Truck() +move() } class Car { #_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class OilTanker { -_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- Car Truck < -- OilTanker Car .. > PeopleHauler</pre><p>Using the information in the UML diagram above, suppose some method of <code>Truck</code> has the line <code>super.move()</code>. Which of these is true?</p></div> <div><div>A</div><div>The <code>move</code> method defined in <code>Truck</code> is executed when that line is executed.</div></div> <div><div>B</div><div>The <code>move</code> method defined in <code>Vehicle</code> is executed when that line is executed.</div></div> <div><div>C</div><div>It depends on whether <code>move()</code> is defined in <code>Vehicle</code>'s superclass</div></div> <div><div>*D*</div><div>The code will not compile, so I cannot run it.</div></div> <div><div>E</div><div>None of the above</div></div> <div><div>Explanation</div><div><code>super.move()</code> refers to the <code>move</code> method defined in <code>Vehicle</code>, and since <code>Vehicle</code>'s <code>move</code> method is abstract this will not compile, even if an ancestor of <code>Vehicle</code> defines a <code>move()</code> method that <code>Vehicle</code> would presumably inherit.</div></div>

Field	Value
ID	629599 [created: 2013-06-10 08:58:43, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	



Using the information in the UML diagram above, suppose we execute the following Java statements:

```
Vehicle vehicle = new OilTanker(2500);
vehicle.move();
```

which definition of `move` will be executed?

A	The one defined in <code>Truck</code>
B	The one defined in <code>Vehicle</code>
C	The one defined in <code>OilTanker</code>
D	The one defined in <code>PeopleHauler</code>
E	The code will not work
Explanation	Since the actual type of <code>vehicle</code> is <code>OilTanker</code> , and since <code>move</code> is an appropriate method for instances of <code>Vehicle</code> , which is <code>vehicle</code> 's declared type, the <code>move</code> method invocation will work, and will be the one defined in <code>OilTanker</code>

Field	Value
ID	629601 [created: 2013-06-10 09:07:59, author: kate (xkate), avg difficulty: 0.0000]
Question	<div>Consider the following code:</div> <pre>public int examMethod(int n) { if (n == 1) return 1; else if (n > 1) return (n + this.examMethod(n-1)); }</pre> <div>What is the purpose of <code>examMethod</code> ?</div>
A	to compute fibonacci(n)
B	to compute factorial(n)
C	to compute the sum of the positive integers from 1 to n
D	none of the above
Explanation	The method returns 1 if n is 1, 2+1 if n is 2, 3+2+1 if n is 3, etc. In other words, it computes the sum of the integers from 1 to n (answer C).
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-3-Funct_ProgGoal, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, LinguisticComplexity-1-Low,

TopicSimon-MethodsFuncsProcs, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	629606 [created: 2013-06-10 09:23:34, author: kate (xkate), avg difficulty: 0.0000]
Question	<div>Consider the following method:</div> <div><pre>public int examMethod(int n) { if (n == 1) return 1; else return (n + this.examMethod(n-1)); }</pre></div> <div>Which of the following inputs will cause a non-terminating recursion?</div>
A	0
B	1
C	20
D	30,000
E	None of the above
Explanation	<p>The base case for this recursion is <code>n == 1</code>. If <code>n</code> is 1, the recursion is done. If <code>n</code> is 20, then the value of <code>n</code> will be reduced by 1 with each recursive call (<code>examMethod(19)</code>, <code>examMethod(18)</code>, etc.), the value of <code>n</code> will finally reach 1, and the recursion will end. Similarly if <code>n</code> is 30,000.</p> <p>But if <code>n</code> is 0 to begin with, then the next recursive call will be to <code>examMethod(-1)</code>, then <code>examMethod(-2)</code>, etc. The value of <code>n</code> will never reach the base case, and the method will (in theory) never terminate.</p>
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Java, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium, TopicSimon-SelectionSubsumesOps, TopicSimon-Testing

Field	Value
ID	629607 [created: 2013-06-10 09:29:24, author: xrobert (xrobert), avg difficulty: 0.0000]
Question	<div><pre>classDiagram class Vehicle { <<abstract>> +move()* +carryCargo() } class Truck { -_weight: int +Truck(int) +Truck() +move() } class OilTanker { -_capacity: int +OilTanker(int, int) +OilTanker(int) +move() } class Car { #_numberOfPeople: int +Car(int) +Car() +holdPeople(int): boolean +move() } class PeopleHauler { <<interface>> +holdPeople(int): boolean +move() } Vehicle < -- Truck Vehicle < -- Car Truck < -- OilTanker Car PeopleHauler</pre></div> <div>Using the information in the UML diagram above, suppose we execute the following Java statements:</div> <div><pre>PeopleHauler pM = new Car(); pM.move();</pre></div>

	which definition of <code>move</code> will be executed?
A	The one defined in <code>Car</code>
B	The one defined in <code>PeopleHauler</code>
C	The one defined in <code>Vehicle</code>
D	The one defined in <code>Truck</code>
E	None of the above
Explanation	The actual type of <code>pM</code> is <code>Car</code> . Since the declared type of <code>pM</code> is <code>PeopleMover</code> , an interface, <code>move</code> is an appropriate method call for <code>pM</code> since it is in the interface. The definition used will be the one in the actual type, <code>Car</code> .

Field	Value
ID	629919 [created: 2013-06-11 04:19:32, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java interface definition:</p> <pre>public interface Mover { public int getX(); public int getY(); public void setLocation(int x, int y); }</pre> <p>Which of the following is a correct implementation of the Mover interface?</p>
A	<pre>public class CartoonCharacter implements Mover{ private int x, y; public int getX(); public int getY(); public void setLocation;</pre>
B	<pre>public class CartoonCharacter implements Mover{ private int x, y; public int getX(); public int getY(); public void setLocation(int x, int y);</pre>
C	<pre>public class CartoonCharacter implements Mover{ private int x, y; public int getX() { // code for method body } public int getY() { // code for method body } }</pre>
D	<pre>public class CartoonCharacter implements Mover{ private int x, y; public int getX() { // code for method body } public int getY() { // code for method body } public void setLocation(int x, int y){ // code for method body } }</pre>
E	<pre>public class CartoonCharacter implements Mover{</pre>

	<pre> private int x, y; public int getX() { // code for method body } public int getY() { // code for method body } public int setLocation(int x, int y){ // code for method body } } </pre>
Explanation	<p>Choice A is wrong because it doesn't include parameter lists or implementations of any of the methods required by the interface.</p> <p>Choice B is wrong because it doesn't include implementations of the methods on the list.</p> <p>Choice C is wrong because it implements some but not all of the interface methods.</p> <p>Choice E is wrong because the method signatures do not match those in the interface.</p> <p>Choice D is the correct answer, because it's the only one where the required methods are all implemented, and their signatures match</p> <p>NOTE: There is no appropriate topic for this question in the list. Suggestion: TopicSimon-interfaces-Java</p>
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, ATT-Type-How, Skill-WriteCode_MeansChooseOption, Difficulty-1-Low, TopicSimon-AAA-XX-ChooseUpToThree, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	629922 [created: 2013-06-11 04:34:23, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java interface:</p> <pre> public interface Mover { public int getX(); public int getY(); public void setLocation(int x, int y); } </pre> <p>Choose the best description of the following implementation of the Mover interface:</p> <pre> public class CartoonCharacter implements Mover{ public int getX(); public int getY(); public void setLocation(); } </pre>
A	The implementation is correct, because it includes all the required methods and their return types are correct.
B	The implementation is incorrect, because it doesn't include the method parameter types.
C	The implementation is incorrect, because it doesn't include implementations of the methods.
D	Both B and C.
Explanation	<p>To implement a Java interface, a class must define all the methods required by the interface (or declare itself abstract).</p> <p>NOTE: There is no appropriate topic for this question. Suggestion: TopicSimon-Interface-Java.</p>
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-DebugCode, ATT-Type-Why, Difficulty-1-Low, TopicSimon-AAA-XX-ChooseUpToThree, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	626600 [created: 2013-06-06 13:39:48, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>1. What is the value of the following Java arithmetic expression?</p> <pre>4 * 3 + 6 / 4</pre>
A	4

B	4.5
C	13
D	9
E	13.5
Explanation	This question addresses two points: first, operator precedence (multiplication and division are both done before addition) and second, integer division. Answer A is wrong about operator precedence: the answer you get if you apply the operators in order from left to right. Answer B makes the same mistake and is also wrong about integer division. Answer D is the answer you get if you assume that addition has a higher precedence than the other two operations. Answer E gets the operator precedence right, but is wrong about integer division. Answer C is the only one that has both right.
Tags	ATT-Transition-ApplyCode, Contributor_Kate_Sanders, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, TopicSimon-ArithmeticOperators, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	625176 [created: 2013-05-22 06:03:25, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	What is the <i>maximum</i> result of computing $X \% 7$, where all we know about X is that it is a positive integer?
A	0
B	1
C	6
D	7
E	There is not enough information in the question description to answer.
Explanation	% is the modular division operation, which perform division and returns the remainder. For example, $7 \% 7$ is 0, since 7 goes into 7 once with a remainder of 0. $8 \% 7$ is 1, since 7 goes into 8 with a remainder of 1. Similarly, $13 \% 7$ is 6, while $14 \% 7$ is again 0, since 7 goes into 14 twice with no remainder. If you mod a positive integer by N, the maximum result is N-1.

Field	Value
ID	618632 [created: 2013-05-28 21:06:54, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which sentence is not correct regarding exception handling in java?
A	A method can throw more than one exception.
B	You can have several catch statement for one try.
C	Statements inside finally run if no exception happens.
D	Statements inside catch are never run unless an exception happens.

Field	Value
ID	618969 [created: 2013-05-29 04:45:28, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What will be outputted? <pre>int c = 1; int result = 10; result += ++c; System.out.print(result+ " "+ c);</pre>
A	12 2
B	11 2
C	12 1
D	11 1

Field	Value
ID	618975 [created: 2013-05-29 04:53:00, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Which of these following codes result the same?</p> <p>1</p> <pre> if (mark == 'A'){ if (GPA > 3.5) x = 1; } else x = 2; </pre> <p>2</p> <pre> if (mark == 'A') if (GPA > 3.5) x = 1; else x = 2; </pre> <p>3</p> <pre> if (mark == 'A'){ if (GPA > 3.5) x = 1; else x = 2; } </pre>
A	1,2
B	2,3
C	1,3
D	1,2,3

Field	Value
ID	618976 [created: 2013-05-29 04:55:26, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be outputted?</p> <pre> int num = 3; int counter = 1; boolean condition = true; while(condition){ num+= counter++; if(num>10){ condition=false; num+= ++counter; } } </pre>

A	counter = 5 num = 16
B	counter = 5 num = 17
C	counter = 6 num = 18
D	counter = 6 num = 19

Field	Value
ID	618977 [created: 2013-05-29 04:57:49, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What will be outputted?</p> <pre> int income = 30; boolean condition1 = true, condition2 = true; if(income < 100) if(income > 10) if(condition1){ System.out.print("A"); if(income < 20) System.out.print("B"); } else System.out.print("C"); if(!condition2){ if(income > 50) System.out.print("D"); } else System.out.print("E"); </pre>
A	AE
B	AC
C	ABC
D	ACE

Field	Value
ID	618978 [created: 2013-05-29 04:59:10, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Fill the gap in such a way that the odd number less than 10 and greater than zero is printed.</p> <pre> for (_____) System.out.println(i+1); </pre>
A	int i = 0; i <= 10; i= i+2
B	int i = 0; i < 10; i= i+2
C	int i = 1; i < 10; i= i+2
D	int i = 1; i <= 10; i= i+2

Field	Value
ID	618980 [created: 2013-05-29 05:02:01, author: marzieh (xmarzieh), avg difficulty: 0.0000]

Question	What would be outputted? <pre> char initial = 'a'; switch (initial){ case 'a': System.out.print("A"); case 'b': System.out.print("B"); default: System.out.print("C"); } </pre>
A	ABC
B	AB
C	BC
D	A

Field	Value
ID	618981 [created: 2013-05-29 05:03:54, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What will be outputted? <pre> char initial = 'a'; switch (initial){ case 'a': System.out.print("A"); default: System.out.print("C"); break; case 'b': System.out.print("B"); break; } </pre>
A	compiler error
B	A
C	AC
D	ACB

Field	Value
ID	618983 [created: 2013-05-29 05:06:58, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What would be the value of sum at the end of executing this code? <pre> int sum; for (int i = 0; i < 2; i++) for (int j = 0; j < 5; j++) { sum = i + j; if (sum > 5) break; else continue; System.out.print(sum); } </pre>

	}
A	Compiler error due to having unreachable code.
B	Compiler error due to not initializing local variable.
C	6
D	5

Field	Value
ID	618984 [created: 2013-05-29 05:08:50, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>To compute the following series, the following code will do the job. What will be the initial value of stat, fact and sum respectively?</p> $-X + X^3/3! - X^5/5! + \dots$ <pre> for (int i = 2; i <= n; i++){ for (int j = 2*i - 1; j > 2*i - 3; j--){ stat *= x; fact *= j; } p_f *= -1; sum += p_f * stat / fact; </pre>
A	1, x, 0
B	x, 1, 0
C	-x, 1, x
D	x, 1, -x

Field	Value
ID	625172 [created: 2013-05-22 06:15:44, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following static method in Java:</p> <pre> public static int[] mystery(int[] arr, int x) { int a=0; for (int i=0; i<arr.length; i++) { if (arr[i] > x) { a++; } } int[] ar2=new int[a]; int z=0; for (int i=0; i<arr.length; i++) { if (arr[i] > x) { ar2[z]=arr[i]; z++; } } return ar2; } </pre> <p>What will this function (static method) return when invoke with the array {1, 9, 3, 4, 9, 4, 5, 2, 7} and the integer 5?</p>
A	{ } (an empty array)
B	{9, 5, 7}
C	{9, 9, 5, 7}
D	{9, 9, 7}

E	It will throw <code>ArrayIndexOutOfBoundsException</code>
Explanation	This method returns a new array that contains only the elements larger than the parameter x.

Field	Value
ID	629923 [created: 2013-06-11 04:50:19, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following interface definition:</p> <pre>public interface Mover { public int getX(); public int getY(); public void setLocation(int x, int y); }</pre> <p>Choose the answer that best describes the following implementation of the <code>Mover</code> interface:</p> <pre>public class CartoonCharacter implements Mover { public int getX(); public int getY(); public void setLocation(int x, int y); }</pre>
A	The implementation is correct, because it includes all the methods.
B	The implementation is correct, because the method names, return types, and parameter lists match the interface.
C	The implementation is incorrect, because the method bodies are not included.
D	Both A and B.
Explanation	<p>A class that implements a Java interface must define all the methods required by the interface (or declare itself abstract).</p> <p>NOTE: There is no appropriate topic for this question. Suggestion: TopicSimon-Interface-Java.</p>
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-DebugCode, ATT-Type-How, Difficulty-1-Low, TopicSimon-AAA-XX-ChooseUpToThree, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-3-Relations, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632832 [created: 2013-06-20 10:43:19, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following code:</p> <pre>if x >= 0: print (1) elif x < 20: print(2) else: print(3) print(4)</pre> <p>For what values of x will 2 be among the values printed?</p>
A	<code>x < 0</code>
B	<code>x >= 0</code>
C	<code>x < 20</code>
D	All values of <code>x</code>
E	None of the above
Explanation	Although the condition of the elif is <code>x<20</code> , all values between 0 and 20 are subsumed (i.e. covered by) the first condition, <code>x>=0</code> . So only values of x strictly less than 0 will result in 2 being printed.

Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, Nested-Block-Depth-1
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Field	Value
ID	633230 [created: 2013-06-12 23:06:14, author: crjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getFalse() getFalse(); } } </pre>
A	T
B	FF
C	F
D	FT
E	Nothing is printed.
Explanation	evaluates the left operand first. It's not true, so it checks the second.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633231 [created: 2013-06-12 23:09:14, author: crjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getTrue() && getTrue(); } } </pre>
A	TT
B	F
C	T
D	FT
E	Nothing is printed.

Explanation	The first operand is true. && requires both be true, so we check the second, which is also true.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633233 [created: 2013-06-12 23:10:39, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getTrue() && getFalse(); } } </pre>
A	T
B	TT
C	TF
D	F
E	Nothing is printed.
Explanation	The first operand is true. && requires both operands be true, so we evaluate the second, which is false.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633234 [created: 2013-06-12 23:12:05, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getFalse() && getTrue(); } } </pre>
A	FT
B	T

C	F
D	FF
E	Nothing is printed.
Explanation	The first operand is false. && requires both be true, so we don't bother to evaluate the second.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633251 [created: 2013-05-25 09:04:00, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Consider the code int i = 3; int *p = &i; Which of the following will print out "The value is 3."?
A	printf("The value is %p", p);
B	printf("The value is %d", *p);
C	printf("The value is %d", &i);
D	printf("The value is %d", &p);
Explanation	The value of p will be the memory address of i -- to dereference p, we need to use *p.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, TopicSimon-Assignment, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633253 [created: 2013-05-25 08:59:53, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Which of the following lines of code will correctly read in the two floats x and y?
A	scanf("%d%d", &x, &y);
B	scanf("&d&d", %x, %y);
C	scanf("%f%f", &x, &y);
D	scanf("&f&f", %x, %y);
Explanation	Scanf requires pointers to x and y -- hence the ampersands. As x and y are floats, %f is used for both.
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, TopicSimon-IO, LinguisticComplexity-1-Low, CS2, TopicWG-Pointers-ButNotReferences, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633271 [created: 2013-06-21 08:48:37, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Kejun has the executable add that adds three command-line args together and prints the result. He runs it like so: ./add 25 10 5 the sum is 40 In his code, what is the value of argc?

A	0
B	1
C	2
D	3
E	4
Explanation	./add is considered a command-line argument
Tags	Contributor_Elizabeth_Patitsas, ATT-Transition-Code_to_CSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-C, Bloom-1-Knowledge, TopicSimon-IO, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CS2, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633272 [created: 2013-06-21 08:48:59, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignment <code>signal = 'abracadabra'</code> , what is returned by <code>signal[:5]</code> ?
A	'abraca'
B	'abrac'
C	'c'
D	An error
E	None of the above
Explanation	This is a slice operation. Slices in Python work with both lists and with Strings, and go up to but not including the limit. Since the limit is 5, we get the first 5 characters (indexed 0 through 4). Hence abrac
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633275 [created: 2013-06-21 08:55:10, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignment <code>signal = 'abracadabra'</code> , what is returned by <code>signal[-1:]</code> ?
A	'a'
B	'abracadabra'
C	"
D	an error
E	none of the above
Explanation	Python actually allows negative indexes, which start counting from the back of a list or String. However, the slice operation by default still only uses increasing indexes. So, slicing [-1:] means to slice from the last character through the rest of the String (slice operations that leave out the upper boundary implicitly mean "slice to the end").
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-NotApplicable, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633276 [created: 2013-06-21 08:56:35, author: patitsas (xelizabeth), avg difficulty: 0.0000]
Question	Ming is hashing the numbers 5, 99, 15, 25 and the hash function $h(k) = k \% 10$. Which collision resolution strategy did she use? <div> <div>0</div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> </div>

	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>25</div> <div>5</div> <div>15</div> <div></div> <div>99</div> </div>
A	Linear probing
B	Quadratic probing
C	Rth probing, R = 2
D	Rth probing, R = 3
Explanation	The 5 is one over from where it should be; the 15 is one over.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Elizabeth_Patitsas, ATT-Type-How, Difficulty-2-Medium, ExternalDomainReferences-1-Low, TopicWG-Hashing-HashTables, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable

Field	Value
ID	633282 [created: 2013-06-21 09:26:59, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	What is returned by <code>'A A Milne' < 'A Linkletter'</code> ?
A	True
B	False
C	'A A Milne'
D	an error
E	none of the above
Explanation	This is a lexicographic (i.e. alphabetic) comparison. The first 2 characters of both strings are the same (i.e. 'A '), but for the third character, 'A' comes before 'L' so we return True.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633229 [created: 2013-06-12 23:04:34, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>What is printed when the following program runs?</p> <pre> public class Main { public static boolean getTrue() { System.out.print("T"); return true; } public static boolean getFalse() { System.out.print("F"); return false; } public static void main(String[] args) { getFalse() getTrue(); } } </pre>
A	TF
B	T
C	F
D	FT
E	Nothing is printed.
Explanation	guarantees left-to-right evaluation, stopping at the first operand that is true.

Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	633226 [created: 2013-06-12 07:32:43, author: crjirc (xchris), avg difficulty: 0.0000]
Question	Many English words have separate singular and plural forms, e.g., "dog" and "dogs." We are trying to write a method that properly pluralizes a word (though naively, by only adding an "s" at the end) if the count we have of that word is not 1. If the count is 1, we leave the word as is. Which of the following proposed solutions does not meet this specification?
A	<pre>String getCounted(String singular, int count) { if (count != 1) { return singular + "s"; } else { return singular; } }</pre>
B	<pre>String getCounted(String singular, int count) { String quantified = singular; if (count != 1) { quantified = quantified + "s"; } return quantified; }</pre>
C	<pre>String getCounted(String singular, int count) { if (count == 1) { return singular; } else { String plural = singular + "s"; return plural; } }</pre>
D	<pre>String getCounted(String singular, int count) { String suffix = null; if (count != 1) { suffix = "s"; } return singular + suffix; }</pre>
E	<pre>String getCounted(String singular, int count) { if (count != 1) { singular += "s"; } return singular; }</pre>
Explanation	Suffix is initialized to null. The concatenation of singular and suffix does not produce the desired behavior.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CodeLength-lines-25-or-more_High, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-1

Field	Value
ID	632833 [created: 2013-06-20 10:35:10, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre>if x >= 0: print (1) elif x < 20:</pre>

	<pre> print(2) else: print(3) print(4) </pre>
	For what integer values of <input type="text" value="x"/> will 1 be among the values printed?
A	<input type="text" value="x < 0"/>
B	<input type="text" value="x >= 0"/>
C	<input type="text" value="x >= 20"/>
D	All values of <input type="text" value="x"/>
E	None of the above
Explanation	Clearly x must be greater than or equal to 0 to for 1 to be printed.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	632840 [created: 2013-06-20 10:51:09, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre> if x >= 0: print (1) elif x < 20: print(2) else: print(3) print(4) </pre> <p>For what integer values of x will 3 be among the values printed?</p>
A	<input type="text" value="x < 0"/>
B	<input type="text" value="x >= 0"/>
C	<input type="text" value="x < 20"/>
D	All values of x
E	None of the above
Explanation	It's not possible to get 3 to print. This is because all possible values of x are covered by if x>=0 and x<20. This creates a range that includes all possible values of x, since any number is either >=0 or < 20.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	632843 [created: 2013-06-20 10:54:59, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre> if x >= 0: print 1 elif x < 20: print 2 else: print 3 </pre>

	print 4 For what values of x will 4 be among the values printed?
A	$x < 0$
B	$x \geq 0$
C	$x \geq 20$
D	All values of x
E	None of the above
Explanation	The statement that prints 4 is NOT part of the if expression; thus it will be printed regardless of what happens with the loop
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-RelationalOperators, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	632879 [created: 2013-06-11 07:32:20, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Converting a value from one type to another sometimes requires an explicit cast and sometimes does not. Which of the following conversions and lines of reasoning explains how to convert a double d to an int i?
A	$i = d$. No explicit cast is necessary because if the conversion isn't valid, an exception is thrown.
B	$i = (\text{int}) d$. An explicit cast is needed to round d to the nearest integer.
C	$i = d$. No explicit cast is necessary because any int can be stored in a double.
D	$i = (\text{int}) d$. An explicit cast is needed because information may be lost in the conversion.
E	$i = d$. No explicit cast is necessary because d isn't changed in the conversion process.
Explanation	Not all doubles can be stored as ints. You must sign off on the potential information loss with an explicit cast.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632918 [created: 2013-06-20 15:26:49, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignment <code>s = 's!am'</code> , which of the following code fragments prints <code>scam</code> ?
A	<code>s[1] = 'c'</code> <code>print(s)</code>
B	<code>s.replace('l', 'c')</code> <code>print(s)</code>
C	<code>s = s[:s.find('l')] + 'c' + s[s.find('l')+1:]</code> <code>print(s)</code>
D	All of the above
E	None of the above
Explanation	A doesn't work because Strings cannot be changed. The <code>[]</code> operation can be used to read values inside a String, but not to change them. B doesn't work because the <code>replace()</code> function does not change the String, it returns a new String. This would work if it were <code>s=s.replace('l', 'c')</code> . C works, it's basically concatenating everything before the 'l' with a 'c' with everything after the 'l'.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633087 [created: 2013-06-18 15:46:13, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>In this question, you are given a Perl regular expression that you are required to evaluate.</p> <p>There are no leading or trailing spaces in any of the text, nor are there any spaces in the regex.</p> <p>Identify the answer which best matches the regex below:</p> <p>/20[0-3]+/</p>
A	205
B	2003
C	0230
D	2300
Explanation	20 followed by one or more digits in the range 0 to 3.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Perl, CSother, TopicSimon-Strings

Field	Value
ID	633095 [created: 2013-06-18 16:09:29, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>In this question, you are given a Perl regular expression that you are required to evaluate.</p> <p>There are no leading or trailing spaces in any of the text, nor are there any spaces in the regex.</p> <p>Identify the answer which matches the regex below:</p> <p>/[A-Z][a-z]{2,4}day/</p>
A	Saturday
B	tuesday
C	Yesterday
D	Today
E	THURSDAY
Explanation	Must start with an upper case letter, be followed by from 2 to 4 lower case letters, and be followed by day.
Tags	ATT-Transition-ApplyCode, Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Perl, CSother, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633097 [created: 2013-06-18 15:59:45, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>In this question, you are given a Perl regular expression that you are required to evaluate.</p> <p>There are no leading or trailing spaces in any of the text, nor are there any spaces in the regex.</p> <p>Identify the answer which matches the regex below:</p> <p>/\d\d\d/</p>
A	1d34
B	A123
C	12
D	12A12D
Explanation	Must contain 3 consecutive digits. It does not matter what comes before or after.

Tags	ATT-Transition-ApplyCode, Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Perl, CSOther, CodeLength-lines-00-to-06_Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops
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Field	Value
ID	633222 [created: 2013-06-12 06:12:05, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	What are the merits of insertion sort compared to bubble sort and selection sort?
A	It doesn't require as much extra storage.
B	It copies elements only to their final locations.
C	It requires less code.
D	It is faster for already sorted data.
E	It can be implement recursively.
Explanation	Neither selection nor bubble sort require extra storage. Selection sort doesn't make unnecessary copies. Bubble sort can be expressed in very little code. Any of them could be expressed recursively. If the array is already sorted, then insertion sort will only make N comparisons and no copies, giving it better performance than the other sorts.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-3-Analysis, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Other, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633223 [created: 2013-06-12 06:18:50, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	What is the output of the following program? <pre> public class Main { public static void swap(int a, int b) { int tmp = a; a = b; b = tmp; } public static void main(String[] args) { int a = 5, b = 7; swap(a, b); System.out.println(a + " " + b); } } </pre>
A	7 5
B	5 7
C	5 5
D	7 7
E	12
Explanation	Main.swap only receives copies of main's a and b. Its assignments do not alter main's variables. Thus, a is still 5 and b is still 7 when the print statement is executed.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633224 [created: 2013-06-12 07:04:26, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	In Java, what does it mean if something is marked <code>static</code> ?
A	It never changes value.

B	It exists outside of any particular instance of the class.
C	It cannot be overridden.
D	Its value is undetermined.
E	It marks the program's starting point.
Explanation	Something that is static is defined at the class level and is accessed through the class, rather than through an instance.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, TopicSimon-OOconcepts, CodeLength-NotApplicable, ConceptualComplexity-1-Low, TopicSimon-Scope-Visibility, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633290 [created: 2013-06-18 07:43:58, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>Suppose you've got a generic class:</p> <pre>class Rosters<T> { ... }</pre> <p>You create a Rosters instance:</p> <pre>Rosters<ArrayList<String>> rosters;</pre> <p>What is the erasure type of Rosters?</p>
A	Object
B	ArrayList<Object>
C	ArrayList<String>
D	Rosters
E	String
Explanation	You need only examine the supertype of generic parameters on the Rosters class to determine the erasure type. There is no explicit supertype, so the supertype is Object.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCode, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633292 [created: 2013-06-21 09:40:02, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre>in_str = input('Enter a string: ') a = '' d = 0 r = 1 for c in 'abcdefghijklmnopqrstuvwxyz': if c in in_str: a = c + a else: d = d + 1 r += 2 print(a) # Line 1 print(d) # Line 2 print(r) # Line 3</pre>

	Given the input <code>'Frick & Frack'</code> what output is produced by Line 1?
A	FrickFrack
B	kcarkcir
C	acikr
D	rkica
E	none of the above
Explanation	Essentially this is filtering out all the upper case and non-alphabetic characters. The for loop goes through each lower-case letter, and if that letter is in the input string <code>in_str</code> , we concatenate the letter to the variable <code>a</code> .
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	633293 [created: 2013-06-21 09:42:38, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre> in_str = input('Enter a string: ') a = '' d = 0 r = 1 for c in 'abcdefghijklmnopqrstuvwxyz': if c in in_str: a = c + a else: d = d + 1 r += 2 print(a) # Line 1 print(d) # Line 2 print(r) # Line 3 </pre> <p>Given the input <code>'Frick & Frack'</code> what output is produced by Line 2?</p>
A	5
B	21
C	10
D	86
E	none of the above
Explanation	This basically counts the number of lower case letters.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings, Nested-Block-Depth-1

Field	Value
ID	633487 [created: 2013-06-21 19:00:02, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code produce?</p> <pre> int result=1; for (int i=1; i<=N; i++) { result *= 2; } System.out.println(result); </pre>

A	0
B	2^N
C	2^N
D	2^{N+1}
E	1
Explanation	This produces 2^N .
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	633548 [created: 2013-06-19 08:05:16, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Which of the following expressions, when applied to each element of the array {0, 1, 2, 3, 4, 5, 6}, produces the array {0, 0, 1, 4, 5, 5, 9}?
A	$x * 3 / 2 + x \% 4$
B	$2 + x - x * x$
C	$x / 10 + x * 10 - x * x \% 20$
D	$(10 - x) * -x$
E	$x + x / 2 - x \% 3$
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, TopicSimon-Arrays, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633549 [created: 2013-06-19 08:10:39, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Your data has 4-bit keys. You also have magical, perfect hash function that will prevent any collisions from happening, provided there is room enough for all possible elements in the array. What's the minimum number of elements the array must be able to hold?
A	8
B	16
C	32
D	64
E	128
Explanation	4-bit keys uniquely identify $2^4 = 16$ elements. The array must be able to hold these 16 items.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, ExternalDomainReferences-0-WWWWWW, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-2-Comprehension, Language-none-none-none, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633551 [created: 2013-06-19 08:20:26, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>You've got this Word class for a project you are working on:</p> <pre> class Word { private String letters; ... public int hashCode() { return letters.charAt(1); } </pre>

	<p>For which of the word lists below is this implementation of hashCode a poor choice?</p>
A	we, us, oh, by
B	aa, bb, cc, dd
C	mom, mill, mull, mat
D	cat, bad, fall, late
E	dinosaur, paroxysm, levitate, apiary
Explanation	The hashCode examines the second letter of each word to find the location in the hashtable. In list D, all words share the second letter 'a,' resulting in many collisions.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_English, ATT-Type-How, Difficulty-1-Low, SkillWG-AnalyzeCode, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Block-Vertical-4-Macro-Structure, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633565 [created: 2013-06-19 14:22:53, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	You know exactly how much data you need to store, but there's not much of it. You do not need to be able to search the collection quickly, but insertion should be as fast as possible. What is the simplest data structure that best suits for your needs?
A	Unordered array
B	Ordered array
C	Linked list
D	Hashtable
E	Binary search tree
Explanation	If you know the memory needs, you can allocate a large enough array. Inserting elements in the array can be done in constant time, and requires less work than inserting in a linked list.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicWG-ChoosingAppropriateDS, TopicSimon-CollectionsExceptArray, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633570 [created: 2013-06-19 15:57:25, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>You've got this code:</p> <pre> TreeMap<String, String> map = new TreeMap<String, String>(); map.put("A", "x"); map.put("AA", "x"); map.put("B", "xxxx"); for (String s : map.keySet()) { System.out.print(map.get(s) + " "); } </pre> <p>What does it print?</p>
A	A A B
B	x x xxxx
C	A* AA* B****
D	A AA B
E	x x x x x x

Explanation	We iterate through each key {"A", "AA", "B"}, looking up and printing the value of these keys.
Tags	Contributor_Chris_Johnson, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633575 [created: 2013-06-19 15:20:49, author: crjirc (xchris), avg difficulty: 0.0000]
Question	You see the expression <code>n = null</code> in code that successfully compiles. Which is not a legal type of <code>n</code> ?
A	Integer
B	String
C	Object
D	ArrayList<String>
E	boolean
Explanation	Boolean's can only be true or false.
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-1-Knowledge, Language-Java, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633580 [created: 2013-06-19 14:51:25, author: crjirc (xchris), avg difficulty: 0.0000]
Question	The number of elements in a hashtable must be prime
A	so that linear probing will terminate
B	so that quadratic probing will terminate
C	to reduce collisions
D	to reduce cluster sizes
E	so that probing with a double hash visits all elements
Explanation	Since the double hash produces a fixed step size for probing, it may be the case that the step size is a factor of the table size. In this case, advancing by the fixed step size will land us in a cycling sequence.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Hashing-HashTables, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633581 [created: 2013-06-19 15:07:56, author: crjirc (xchris), avg difficulty: 0.0000]
Question	<p>You've got a class that holds two ints and that can be compared with other IntPair objects:</p> <pre> class IntPair { private int a; private int b; public IntPair(int a, int b) { this.a = a; this.b = b; } public int compareTo(IntPair other) { if (a < other.a) { return -1; } else if (a > other.a) { return 1; } } } </pre>

```

    } else {
        if (b == other.b) {
            return 0;
        } else if (b > other.b) {
            return -1;
        } else {
            return 1;
        }
    }
}
}
}

```

Let's denote new IntPair(5, 7) as [5 7]. You've got a list of IntPairs:

[3 7], [4 6], [3 4]

You sort them using IntPair.compareTo. What is their sorted order?

A [3 4], [3 7], [4 6]

B [3 7], [3 4], [4 6]

C [4 6], [3 7], [3 4]

D [4 6], [3 4], [3 7]

Explanation The compareTo orders first by IntPair.a in ascending order, and in the case of a tie, but IntPair.b in descending order.

Tags Contributor_Chris_Johnson, Nested-Block-Depth-2-two-nested, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, CS2, TopicSimon-OOconcepts, TopicWG-Searching, CodeLength-lines-06-to-24_Medium, TopicSimon-RelationalOperators, TopicWG-Sorting-Other, ConceptualComplexity-2-Medium

Field	Value
ID	633601 [created: 2013-06-22 03:48:13, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int outer=0; int inner=0; for (int i=0; i<6; i++) { outer++; for (int j=0; j<=i; j++) { inner++; } } System.out.println("outer "+outer+", inner "+inner); </pre>
A	outer 6, inner i
B	outer 6, inner 24
C	outer 6, inner 21
D	outer 24, inner 24
E	outer 6, inner 24
Explanation	<p>The inner loop is based on the current iteration of the outer loop. If we track the values:</p> <p>outer 0, inner 0</p> <p>outer 1, inner 0,1</p> <p>outer 2, inner 0,1,2</p> <p>and so on up to 6.</p> <p>If we add up all of the inner values, there are 21 of them.</p> <p>This is the classic "triangle" pattern, because the inner values proceed like this:</p> <pre> 0 0 1 </pre>

	0 1 2 0 1 2 3 0 1 2 3 4 0 2 3 4 4 5
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium

Field	Value
ID	633602 [created: 2013-06-22 03:55:28, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int outer=0; for (int i=0; i<12; i++) { if (i % 2 == 0) { outer++; } } System.out.println(outer); </pre>
A	12
B	6
C	3
D	1
E	0
Explanation	i % 2 == 0 is true only when i is 0. This loop counts the number of even values between 0 and 12, exclusive (because the loop body doesn't execute when i is 12, the loop ends instead). In this case the result is 6 (0, 2, 4, 6, 8, 10).
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low

Field	Value
ID	633470 [created: 2013-06-21 17:40:50, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>How many times does the following Java code print "hello world"?</p> <pre> for (int i=10; i>=4; i++) { System.out.print("hello world"); } </pre>
A	0
B	1
C	5
D	6
E	none of the above
Explanation	Trick question! This is an infinite loop, because the update condition is i++, but we are starting at 10 and continue while i>=4!
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	633468 [created: 2013-06-21 17:37:48, author: jspacco (xjaime), avg difficulty: 0.0000]

Question	<p>What does the following Java code print?</p> <pre> for (int i=6; i>=2; i--) { System.out.print(i+" "); } </pre>
A	6 5 4 3 2 1 0
B	6 5 4 3 2 1
C	6 5 4 3 2
D	6 5 4 3
E	the loop is infinite
Explanation	This is a basic for loop that counts down from 6 to 2.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	633294 [created: 2013-06-18 07:55:35, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	You are storing a complete binary tree in an array, with the root at index 0. At what index is node i's left child?
A	2i
B	2i + 1
C	i + i + 2
D	i / 2 + 1
E	(i` - 1) / 2
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, TopicSimon-AlgorithmComplex-BigO, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, TopicWG-Trees-Other, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633297 [created: 2013-06-21 09:45:56, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre> in_str = input('Enter a string: ') a = '' d = 0 r = 1 for c in 'abcdefghijklmnopqrstuvwxyz': if c in in_str: a = c + a else: d = d + 1 r += 2 print(a) # Line 1 print(d) # Line 2 print(r) # Line 3 </pre>
A	2
B	3
C	21
D	27

E	53
Explanation	The statement <code>r+=2</code> is not inside the loop, so we just assign 1 to <code>r</code> , then add 2 to it to get 3.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings, Nested-Block-Depth-1

Field	Value
ID	633305 [created: 2013-06-21 09:57:24, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre>s = input('Enter a string: ') w = '' for c in s: if c in "0123456789": #REPLACE else: w = w + c print w</pre> <p>What replacement for the comment <code>#REPLACE</code> will cause the program to print the input string with all of the digits removed? In other words, for the 'aaa3b3c1', we would print 'aaabc'.</p>
A	break
B	continue
C	return w
D	any of the above
E	none of the above
Explanation	<p>A is wrong because <code>break</code> will end the loop.</p> <p>C is wrong because the problem asks us to print, not to return.</p> <p>The <code>continue</code> statement works because it goes back to the top of the loop.</p>
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings, Nested-Block-Depth-1

Field	Value
ID	633306 [created: 2013-06-21 09:53:12, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Consider the following Python code:</p> <pre>s = input('Enter a string: ') w = '' for c in s: if c in "0123456789": #REPLACE else: w = w + c print(w)</pre> <p>What replacement statement for the comment <code>#REPLACE</code> will cause the code to print out all of the characters up to the first digit? In other words, if the input is 'aaa3bb3c1', we should output 'aaa'.</p>
A	break
B	continue
C	return w

D	any of the above will work
E	none of the above
Explanation	B is wrong because <code>continue</code> will skip the digits but continue with the rest of the String. C is wrong because the exercise asks us to PRINT , not return the String.
Tags	Nested-Block-Depth-2-two-nested, ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Bloom-3-Analysis, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, TopicSimon-Strings

Field	Value
ID	633307 [created: 2013-06-18 08:02:54, author: crjrc (xchris), avg difficulty: 0.0000]
Question	Searching a heap is
A	$O(1)$
B	$O(\log N)$
C	$O(N)$
D	$O(N \log N)$
E	$O(N^2)$
Explanation	In a heap, we only know that a node's key is greater than both its children's keys. We may need to search both subheaps for an element. In the worst case, we'll visit every element.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Bloom-2-Comprehension, Language-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633308 [created: 2013-06-18 08:05:31, author: crjrc (xchris), avg difficulty: 0.0000]
Question	What is the heap condition?
A	All but the leaf nodes have two children
B	The tree is a binary tree
C	Each node's key is greater than its children's keys
D	Only the last level of the tree may not be full
E	No leaf node has children
Explanation	All are true, but only C provides the definition of the heap condition.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Block-Vertical-4-Macro-Structure, Bloom-1-Knowledge, Language-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633309 [created: 2013-06-18 08:12:44, author: crjrc (xchris), avg difficulty: 0.0000]
Question	Why can a heap be efficiently implemented using an array instead of a linked structure?
A	Linked implementations consume more space
B	The array never needs to change size
C	The heap condition makes it easier to calculate indices
D	We only traverse the heap in a breadth-first fashion

E	It is complete
Explanation	Because the heap is complete, the elements can be stored contiguously and parent and child nodes (which we're guaranteed to have) fall in locations we can compute with simple arithmetic.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCSspeak, Skill-PureKnowledgeRecall, Difficulty-1-Low, ATT-Type-Why, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-CollectionsExceptArray, TopicWG-Heaps, Block-Vertical-4-Macro-Structure, Bloom-2-Comprehension, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633396 [created: 2013-06-19 07:49:31, author: crjirc (xchris), avg difficulty: 0.0000]
Question	<p>You have a class Custom:</p> <pre>class Custom { private int i; ... public String toString() { return "" + i; } }</pre> <p>Consider this code, which prints a Custom instance:</p> <pre>Custom a = ...; System.out.println(a);</pre> <p>What overloaded version of PrintStream.println is called?</p>
A	println(String s)
B	println(Custom c)
C	println(int i)
D	println()
E	println(Object o)
Explanation	The version of println that we call must have a type that is a supertype of Custom, leaving only Custom and Object as our two choices. Since PrintStream was written years before our Custom class ever existed, it doesn't know anything about our class. However, it does know about Objects and that all Objects have a toString method.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCode, Skill-ExplainCode, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-1-Low, TopicSimon-MethodsFuncsProcs, CS2, TopicSimon-OOconcepts, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	633461 [created: 2013-06-21 17:29:48, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre>int sum=0; for (int i=1; i<=5; i++) { sum += i; } System.out.println(sum);</pre>
A	0
B	5
C	10
D	15
E	20
Explanation	This is basically 1 + 2 + 3 + 4 + 5

Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1
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Field	Value
ID	633462 [created: 2013-06-21 17:31:47, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int sum=0; for (int i=0; i<10; i+=4) { sum += i; } System.out.println(sum); </pre>
A	4
B	8
C	12
D	16
E	20
Explanation	0 + 4 + 8
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	633463 [created: 2013-06-21 17:35:09, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>What does the following Java code print?</p> <pre> int sum=0; for (int i=0; i>100; i++) { sum += i; } System.out.println(sum); </pre>
A	0
B	100
C	0 + 1 + 2 + ... + 99 + 100
D	0 + 1 + 2 + ... + 98 + 99
E	none of the above
Explanation	This is a trick question! The stop condition of the for loop is i>100, and since i starts at 0, i is never > 100, so the loop immediately ends.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Nested-Block-Depth-1

Field	Value
ID	633607 [created: 2013-06-22 04:34:25, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	<p>Suppose the following Java code prints "statement 2":</p> <pre> if (num < 6) { System.out.println("statement 1"); } else { System.out.println("statement 2"); } </pre>

	<p>What must be true about num?</p>
A	greater than 6
B	greater than or equal to 6
C	less than 6
D	less than or equal to 6
E	this program cannot print "statement 2"
Explanation	The opposite of less than is greater than or equal to. Not just greater than.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-3-Analysis, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-1

Field	Value
ID	632809 [created: 2013-05-21 08:30:16, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	Suppose <code>a</code> is <code>true</code> , <code>b</code> is <code>false</code> , and <code>c</code> is <code>false</code> . Which of the following expressions is <code>true</code> ?
A	<code>b && c && !a</code>
B	<code>!a (b c)</code>
C	<code>c && !a</code>
D	<code>!c && !b</code>
E	<code>!!b</code>
Explanation	Substitute: <ul style="list-style-type: none"> 1. <code>!c && !b</code> 2. <code>!false && !false</code> 3. <code>true && true</code> 4. <code>true</code>
Tags	Contributor_Chris_Johnson, ATT-Transition-CSspeak_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, Language-Java, Bloom-2-Comprehension, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632100 [created: 2013-06-14 23:20:51, author: tclear (xtony), avg difficulty: 0.0000]
Question	Only one of the following will not compile and run under Quick C. Which one?
A	<code>main(){}</code>
B	<code>main(void){}</code>
C	<code>int main(){return 65535;}</code>
D	<code>int main(void){return 1}</code>
E	<code>void main(void){}</code>
Explanation	The semi-colon end of line delimiter occurs within a curly bracket pairing, which is not a logical combination from the compiler's parsing perspective
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Language-C, Bloom-2-Comprehension, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-00-to-06_Low

Field	Value
ID	632147 [created: 2013-06-17 23:01:10, author: tclear (xtony), avg difficulty: 0.0000]
Question	What is output by the code shown in the question below. Think about it carefully - it may be a bit tricky!

	<pre> void main (void) { #define LIMIT 8 int i = 0; while (i++ < LIMIT) { if (i) { printf("%d", LIMIT - i); } } } </pre>
A	Nothing
B	876543210
C	876543210-1
D	76543210
E	76543210-1
Explanation	The while loop increments the index before each iteration of the loop and the resulting increased index value is subtracted from the Limit of 8. Thus the values printed range from 7 to 0.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-IO, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632170 [created: 2013-06-17 23:42:32, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>You are preparing test data for this function that accepts a day of the month (as a number) from the user:</p> <pre>int iGetDay(int iMonth);</pre> <p>You are currently working with a month value of 5 (May). What should your boundary test values be for iGetDay?</p>
A	-1, 0, 30, 31
B	-1, 0, 31, 32
C	0, 1, 29, 30
D	0, 1, 30, 31
E	0, 1, 31, 32
Explanation	The month of May has 31 days and starts on the 1st of May. So the day before and the day after these boundary days constitute the boundary test conditions
Tags	Skill-TestProgram, Contributor_Tony_Clear, Difficulty-2-Medium, Language-C, Bloom-3-Analysis, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, TopicSimon-Testing

Field	Value
ID	632177 [created: 2013-06-18 00:15:35, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>How many times will the printf statement be executed in this code?</p> <p>In each case assume the definition</p> <pre>int i = 0;</pre> <p>WARNING There are some very nasty traps in some of the code here. LOOK AT IT ALL VERY CAREFULLY!</p> <pre>do { </pre>

	<pre>printf("Count me!"); i++; } while(++i < 10);</pre>
A	0
B	5
C	6
D	10
E	11
Explanation	The line <code>i++</code> ; in the body of the loop after the <code>printf</code> function, in combination with the <code>++i</code> preceding each iteration in the while loop, causes the index to increment twice in each iteration, so the <code>printf</code> function is only executed 5 times
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-C, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	632194 [created: 2013-06-18 02:18:14, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>The worst-case analysis (Big-Oh) of the following Java code is:</p> <pre>for (j=0; j<n; j++) { for (k=0; k<n; k++) { base = base * 2; } }</pre>
A	$O(1)$
B	$O(n)$
C	$O(n^2)$
D	$O(\log_2 n)$
E	$O(2^n)$
Explanation	The body of the inner loop will be executed n^2 times. Each execution will take a constant amount of time. Thus, the total amount of time will be a function of n^2
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium

Field	Value
ID	632195 [created: 2013-06-18 01:58:23, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>The worst-case analysis (Big-Oh) of the following Java code is:</p> <pre>for (j=0; j<n; j++) { base = base * 2; }</pre>
A	$O(1)$
B	$O(n)$
C	$O(n^2)$
D	$O(\log_2 n)$
E	$O(2^n)$

Explanation	The loop will be executed n times, and each time involves a certain constant amount of work.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	632221 [created: 2013-06-18 07:09:00, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java code:</p> <pre>public interface StackADT<T> { // 1 public void push (T element); public T pop(); public T peek(); public boolean isEmpty(); }</pre> <p>The capital letter "T" on line 1 stands for:</p>
A	a temporary value
B	the type of the items in the Stack
C	a class named T defined somewhere else in the program
D	the top of the stack
E	none of the above
Explanation	This interface is defined using Java's generics. We can tell what the T means by looking at how it is used. The "T" in angle brackets on line 1 corresponds to the type of the parameter to <code>push</code> and the type of value returned by <code>pop</code> and <code>peek</code> . In other words, it is the type of value stored in the stack.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-ExplainCode, Difficulty-2-Medium, TopicWG-ADT-Stack-DefInterfaceUse, Block-Horizontal-1-Struct_Text, Block-Vertical-2-Block, TopicSimon-DataTypesAndVariables, TopicWG-JavaInterface, Bloom-1-Knowledge, Language-Java, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632224 [created: 2013-06-18 07:18:14, author: kate (xkate), avg difficulty: 0.0000]
Question	The <code>StackADT</code> 's <code>push</code> operation:
A	adds a new item at the bottom of the Stack
B	returns without removing the top item on the Stack
C	removes and returns the top item on the Stack
D	adds a new item at the top of the Stack
E	returns true if the Stack is empty and otherwise false
Explanation	"push" is the traditional term for adding a new item to a stack. Stacks work like a pile of paper. The bottom piece of paper is the first one that was put in the pile. The top piece of paper was added most recently. When another piece of paper is added to the stack, it goes on top of the rest of the pile.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-Implementations, ExternalDomainReferences-1-Low, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, LinguisticComplexity-2-Medium, TopicSimon-MethodsFuncsProcs, CS2, CodeLength-lines-00-to-06_Low, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632254 [created: 2013-06-18 09:20:32, author: kate (xkate), avg difficulty: 0.0000]
Question	Suppose you are trying to choose between an array and a linked list to store the data in your Java program. Which data structure can change size as needed while the program is running?
A	an array

B	a linked list
C	both
D	neither
Explanation	When initializing a Java array, you must allocate a fixed amount of memory for storing data. Linked lists vary in size depending on how much data they contain.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, TopicWG-ChoosingAppropriateDS, Block-Vertical-1-Atom, TopicWG-LinkedLists, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632285 [created: 2013-06-18 11:14:35, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Suppose <code>StackADT</code> is implemented in Java using a linked list. The big-Oh time complexity of the following <code>pop</code> method is:</p> <pre> public T pop() { T tmp; if (this.top == null) tmp = null; else { tmp = this.top.getElement(); this.top = this.top.getNext(); } return tmp; } </pre>
A	$O(1)$
B	$O(\log n)$
C	$O(n)$
D	$O(n^2)$
E	$O(2^n)$
Explanation	These operations can be done in constant time, independent of the size of the stack.
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, TopicWG-ADT-Stack-Implementations, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicWG-LinkedLists, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	632288 [created: 2013-06-18 11:24:55, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java method:</p> <pre> public T pop() { \ 1 T tmp; \ 2 if (this.top == null) \ 3 tmp = null; \ 4 else { \ 5 tmp = this.top.getElement(); \ 6 this.top = this.top.getNext(); \ 7 } \ 8 return tmp; \ 9 } \ 10 </pre> <p>What would happen if line 7 were before line 6?</p>
A	The code would not compile.
B	The code would compile, but it wouldn't run.
C	The code would compile and run, but it would return the wrong value.

D	The code would compile and run, and it would work just the same.
Explanation	If the two lines are re-ordered, the code will change the value of top to the second node, and then the second value in the stack will be the one that is returned.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-Implementations, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, TopicWG-LinkedLists, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	632293 [created: 2013-06-18 11:34:15, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Consider the following Java method:</p> <pre> public T pop() { // 1 T tmp; // 2 if (this.top == null) // 3 tmp = null; // 4 else { // 5 tmp = this.top.getElement(); // 6 this.top = this.top.getNext(); // 7 } // 8 return tmp; // 9 } // 10 </pre> <p>What would happen if line 7 were before line 6?</p>
A	The code would not compile.
B	The code would compile, but it wouldn't run.
C	The code would compile and run, but it would return the wrong value.
D	The code would compile and run, and it would work just the same.
Explanation	If the two lines are re-ordered, the code will change the value of top to the second node, and then the second value in the stack will be the one that is returned.
Tags	Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-2-Medium, TopicWG-ADT-Stack-Implementations, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Assignment, Block-Vertical-2-Block, TopicWG-LinkedLists, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

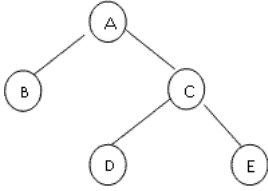
Field	Value
ID	632137 [created: 2013-06-17 22:14:35, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What is output by the code shown below. Think about it carefully - it may be a bit tricky!</p> <pre> #define DEF_1 (2 + 2) #define DEF_2 DEF_1 - DEF_1 int main(void) { printf("%d", DEF_2); } </pre>
A	0
B	2
C	4
D	6
E	8
Explanation	The declaration of DEF_2 [DEF_1 after subtracting DEF_1 = 0] is the value printed.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-ArithmeticOperators, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, TopicSimon-IO, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low

Field	Value
ID	632131 [created: 2013-06-17 21:44:27, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>What is output by the code shown below. Think about it carefully -it may be a bit tricky!</p> <pre>void main(void) { static char szCode[] = "111"; szCode[2] = '0'; puts(szCode); }</pre>
A	Nothing
B	011
C	101
D	110
E	111
Explanation	The value of the character in the array at index [2] (where index starts from 0) is set to zero and the other initialized array values remain unchanged
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, TopicSimon-Arrays, Block-Vertical-2-Block, Language-C, Bloom-2-Comprehension, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	632106 [created: 2013-06-17 20:45:00, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What would be the performance of removeMin and insert methods in a priority queue if it is implemented by an unsorted list?
A	O(1) , O(1)
B	O(1) , O(n)
C	O(n) , O(1)
D	O(n) , O(n)

Field	Value
ID	632107 [created: 2013-06-14 22:35:47, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider this code. It is part of a program that receives MMP list votes from constituencies and stores them in a database. The field PartyName stores the names of each party involved, and the field VoteTotal keeps a running total of list votes for a party. Tally is a table-type Recordset.</p> <pre>Do ' Get a name and vote pair from the newly arrived text ' Returns 0 when there are no more pairs Start% = ExtractNextPair((txtData.Caption), Start%,_ PartyName\$_Votes&) If Start% > 0 Then ' See if the party name is already present KeyField\$ = UCase\$(Trim\$(PartyName\$)) Tally.Seek "=", KeyField\$ If Tally.NoMatch Then ' Add a new record Tally.AddNew Tally("PartyName") = KeyField\$</pre>

	<pre> Tally("VoteTotal") = Votes Else ' Update the existing record - add latest votes Tally.Edit Tally("VoteTotal") = Tally("VoteTotal") + Votes End If End If Loop While Start% > 0 Tally.Update Why does this code not successfully store all the incoming data? </pre>
A	The loop logic is wrong - it should be Start% < 0
B	There was no call to Tally.Refresh
C	There was no call to Tally.UpdateRecords
D	The line Tally.Update must come inside the loop
E	The AddNew and Edit lines should be swapped
Explanation	Because the line Tally.Update is outside the loop it is only executed once at the end of the program
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-3-High, Block-Horizontal-3-Funct_ProgGoal, Block-Vertical-3-Relations, TopicSimon-FileIO, Bloom-3-Analysis, Language-VB, TopicSimon-LoopsSubsumesOperators, CS1, TopicSimon-Params-SubsumesMethods, CodeLength-lines-06-to-24_Medium

Field	Value
ID	632112 [created: 2013-06-17 20:54:15, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>What node will be visited prior to E in an inorder traversal of the following tree?</p>  <pre> graph TD A((A)) --- B((B)) A --- C((C)) C --- D((D)) C --- E((E)) </pre>
A	A
B	B
C	C
D	D

Field	Value
ID	632115 [created: 2013-06-14 00:24:46, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Consider these lines of code:</p> <pre> txtName.SetFocus txtName.SelStart = 0 txtName.SelLength = Len(txtName.Text) </pre> <p>txtName is an edit text box which is currently visible.</p> <p>The code may cause a run time error. This will happen if:</p>
A	txtName is a multiline text box.
B	there is no text in txtName.

C	txtName is currently disabled.
D	some of the text in txtName is currently highlighted.
E	none of the text in txtName is currently highlighted.
Explanation	A disabled edit text box may not be accessed by the setfocus method as this combination is not a logical action and therefore clashes with the underlying VB event model which controls the permissible sequences of events.
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-3-Analysis, TopicSimon-GUI-Design-Implementat, Language-VB, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	632116 [created: 2013-06-17 21:01:57, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	What would be the minimum number of required queue, to implement a stack?
A	1
B	2
C	3
D	4

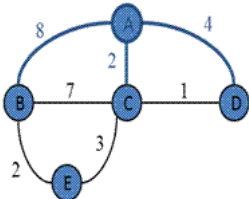
Field	Value
ID	632117 [created: 2013-06-17 21:03:19, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Which data structures would be proper in terms of performance to implement flight waiting lists?
A	Priority Queue
B	Heap
C	Array
D	Linked list

Field	Value
ID	632121 [created: 2013-06-17 21:04:42, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	To implement student's database, which data structure is more appropriate?
A	Heap
B	Binary Tree
C	Map
D	Priority Queue

Field	Value
ID	632124 [created: 2013-06-17 21:08:25, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	Using double hashing and following hash function and data, in which array slot number 31 will be inserted*? $N = 13$ $h(k) = k \bmod 13$ $d(k) = 7 - k \bmod 7$ $(h(k) + jd(k)) \bmod 13$ 18, 41, 22, 44, 59, 32, 31, 73 *Credit goes to Goodrich et.al. (Data Structures & Algorithms in Java)

A	0
B	5
C	9
D	10

Field	Value
ID	632125 [created: 2013-06-13 23:54:59, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Given the declaration</p> <p>Public StudentRecords as Collection</p> <p>What line of code is required before the first student record is added to the collection?</p>
A	StudentRecords = New Collection
B	Set StudentRecords = Collection
C	Set StudentRecords = New Collection
D	Set Collection = StudentRecords
E	Set StudentRecords.New
Explanation	Set assigns an object reference to the new Collection object named StudentRecords
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, TopicSimon-CollectionsExceptArray, Bloom-1-Knowledge, TopicSimon-FileIO, Language-VB, CS1, CodeLength-lines-00-to-06_Low

Field	Value
ID	632126 [created: 2013-06-17 21:11:06, author: marzieh (xmarzieh), avg difficulty: 0.0000]
Question	<p>Using Dijkstra's Algorithm what would be the path between A and B?</p> <p>(Picture taken from Data Structures & algorithms in Java by Goodrich et. al.)</p> 
A	AB
B	ACB
C	ACEB
D	ADCEB

Field	Value
ID	632127 [created: 2013-06-13 23:31:12, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>The following processes are arranged in alphabetical order:</p> <ol style="list-style-type: none"> 1 Application event procedure is called. 2 Event procedure code is executed. 3 User clicks on a button with the mouse. 4 Windows detects an event. 5 Windows passes a message to the application containing the button.

	In what order will these processes normally occur in a Visual Basic application?
A	3, 4, 5, 1, 2
B	2, 3, 5, 4, 1
C	4, 3, 2, 5, 1
D	3, 5, 4, 1, 2
E	1, 2, 3, 5, 4
Explanation	The button click causes windows to detect an event and pass a message to the application containing the button. The application event procedure is called and the event procedure code is executed.
Tags	Skill-ExplainCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Bloom-2-Comprehension, TopicSimon-GUI-Design-Implementat, Language-VB, CS1, TopicSimon-MethodsFuncsProcs, CodeLength-lines-00-to-06_Low, TopicSimon-ProgramDesign

Field	Value
ID	632327 [created: 2013-06-18 12:09:21, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>This Perl script does not work correctly. It is supposed to work out the average assessment mark for a student who has 6 marked exercises.</p> <p>Whatever data the student enters, the script always displays an average mark of zero.</p> <p>Note that line numbers have been added for reference only – they are not part of the script</p> <pre> 1 my \$total = 0; 2 3 for(my \$mk = 1; \$mk <= 6; \$mk++) 4 { 5 print "Enter mark \$mk: "; 6 my \$mark = <STDIN>; 7 my \$total += \$mark; 8 } 9 10 my \$average = \$total / 6; 11 print "Average mark = \$average.\n"; </pre> <p>What is the problem?</p>
A	<= 6 on line 3 should be <
B	The my on line 6 should not be there.
C	The my on line 7 should not be there.
D	Line 10 should show \$mark / 6.
E	<p>A <= 6 on line 3 should be <</p> <p>B The my on line 6 should not be there.</p> <p>C The my on line 7 should not be there.</p> <p>D Line 10 should show \$mark / 6.</p>
Explanation	<p>A my declares the listed variables to be local (lexically) to the enclosing block, file, or eval.</p> <p>source http://perldoc.perl.org/functions/my.html</p> <p>Therefore the accumulated value of \$total is not available to the following block where the average is calculated</p>
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, Block-Vertical-2-Block, Language-Perl, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CSother, CodeLength-lines-06-to-24_Medium, TopicSimon-Scope-Visibility

Field	Value

ID	632332 [created: 2013-06-18 12:29:51, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>This Perl subroutine does not work correctly. It is supposed to work out whether or not a person qualifies for a discount and return the correct fare, discounted or not as the case may be. Children under 13, and elderly people 65 and over qualify for a discount.</p> <p>The subroutine never gives a discount</p> <p>Note that line numbers have been added for reference only – they are not part of the script</p> <pre>1 sub getDiscount 2 { 3 my \$age = \$_[0]; # First parameter is age 4 my \$fare = \$_[1]; # Second parameter is fare 5 6 if((\$age < 13) && (\$age >= 65)) 7 { 8 \$fare *= 0.9; # 10% discount 9 } 11 12 return \$fare; 13 }</pre> <p>What is the problem?</p>
A	\$_ on lines 3 and 4 should be @_.
B	The and (&&) on line 6 should be an or ()..
C	On line 6, the < should be replaced by <=.
D	The return statement on line 12 should return \$_[0].
Explanation	No age can be less than 13 AND 65 and over. It should be OR.
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Language-Perl, Bloom-3-Analysis, CSother, CodeLength-lines-06-to-24_Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	632333 [created: 2013-06-18 12:20:58, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>This Bash command was supposed to run a Perl script, exE1.pl from a University student's bin directory on the Cislinux server, passing it a command line argument which was a text file in the copy area. It was supposed to put the results into a text file in the student's bin directory.</p> <pre>~/bin/exE1.pl /copy/ex/exe-1.txt > /bin/exe1out.txt</pre> <p>Why will this give an error?</p>
A	~ cannot be used at the start of a line
B	.txt is not a valid extension in linux
C	> does not redirect output
D	Students cannot write to /bin
Explanation	The /bin directory has restricted access for security reasons to prevent students running unauthorised code on the server or modifyng or overwriting other programs in the directory
Tags	Skill-DebugCode, Contributor_Tony_Clear, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Perl, TopicSimon-FileIO, CSother, CodeLength-lines-00-to-06_Low

Field	Value
ID	632758 [created: 2013-06-20 00:26:53, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "maxPos":</p> <pre>public static int maxPos(int[] y, int first, int last) {</pre>

```

/* This method returns the position of the maximum element in the
 * subsection of the array "y", starting at position
 * "first" and ending at position "last".
 */

int bestSoFar = first;

xxx missing for loop goes here

return bestSoFar;

} // method maxPos

```

In this question, the missing "for" loop is to run "forwards". That is, the code should search the array from the low subscripts to the high subscripts. Given that, the correct code for the missing "for" loop is:

A

```

for (int i=last; i>first; i--) {
    if ( y[i] < y[bestSoFar] ) {
        bestSoFar = i;
    } // if
} // for

```

B

```

for (int i=first+1; i<=last; i++) {
    if ( y[i] > y[bestSoFar] ) {
        bestSoFar = i;
    } // if
} // for

```

C

```

for (int i=last; i>first; i--) {
    if ( y[i] > y[bestSoFar] ) {
        bestSoFar = i;
    } // if
} // for

```

D

```

for (int i=last; i>first; i--) {
    if ( y[i] < bestSoFar ) {
        bestSoFar = i
    } // if
} // for

```

E

```

for (int i=first+1; i<=last; i++) {
    if ( y[i] > bestSoFar ) {
        bestSoFar = i;
    } // if
} // for

```

Explanation

Explanation

a)

INCORRECT:

if (y[i] < y[bestSoFar]) ... This is setting bestSoFar to the index of the SMALLEST number so far, but this is MAXPOS, it needs to find the highest!

b)

CORRECT:

The code finds the maximum position in the array, searching forwards as intended.

c)

CORRECT:

The loop is running backwards.

d)

INCORRECT:

The if statement compares y[i] with the integer bestSoFar, not what is in the array at the position bestSoFar.

e)

INCORRECT:

	Same as c) and d)
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-1-Low, ConceptualComplexity-2-Medium

Field	Value
ID	632760 [created: 2013-06-19 21:28:34, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "maxPos":</p> <pre> public static int maxPos(int[] y, int first, int last) { /* This method returns the position of the maximum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = first; xxx missing for loop goes here return bestSoFar; } // method maxPos </pre> <p>In this question, the missing "for" loop is to run "backwards". That is, the code should search the array from the high subscripts to the low subscripts. Given that, the correct code for the missing "for" loop is:</p>
A	<pre> for (int i=last; i>first; i--) { if (y[i] < y[bestSoFar]) { bestSoFar = i; } // if } // for </pre>
B	<pre> for (int i=first+1; i<=last; i++) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for </pre>
C	<pre> for (int i=last; i>first; i--) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for </pre>
D	<pre> for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { bestSoFar = i } // if } // for </pre>
E	<pre> for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) { bestSoFar = i; } // if } // for </pre>
Explanation	<p>a)</p> <p>INCORRECT:</p> <p>if (y[i] < y[bestSoFar]) ... This is setting bestSoFar to the index of the SMALLEST number so far, but this is MAXPOS, it needs to find the highest!</p>

	<p>b)</p> <p>INCORRECT:</p> <p>The loop starts at [first+1] ... This loop is not running backwards.</p> <p>c)</p> <p>CORRECT:</p> <p>The code finds the maximum position in the array, searching backwards as intended.</p> <p>d)</p> <p>INCORRECT:</p> <p>The if statement compares y[i] with the integer bestSoFar, not what is in the array at the position bestSoFar.</p> <p>c)</p> <p>INCORRECT:</p> <p>Same as b) and d)</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-1-Low, ConceptualComplexity-2-Medium

Field	Value
ID	632765 [created: 2013-06-20 04:00:09, author: ray, avg difficulty: 0.0000]
Question	<p>The following code for a method "minVal" contains a logic error on a single line in the method body, on one of the four lines indicated by comments:</p> <pre>public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = first; // line 1 for (int i=first+1; i<=last; i++) { if (y[i] < bestSoFar) // line 2 bestSoFar = y[i]; // line 3 } // for return bestSoFar; // line 4 } // method minVal</pre> <p>Which one of the four lines indicated by the comments contains the logic error?</p>
A	line 1
B	line 2
C	line 3
D	line 4
Explanation	<p>line 1 should be <code>int bestSoFar = y[first];</code></p> <p>This correct code assigns the value at <code>y[first]</code> into bestSoFar. This is because the other lines are using bestSoFar to remember the best VALUE seen thus far.</p>
Tags	Nested-Block-Depth-2-two-nested, Skill-DebugCode, ATT-Transition-DefineCSspeak, Contributor_Raymond_Lister, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-00-to-06_Low, Neo-Piaget-3-Concrete_Operational, ConceptualComplexity-2-Medium

Field	Value
ID	632767 [created: 2013-06-20 04:09:56, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following code for a method "minVal" contains a logic error on a single line in the method body, on one of the four lines indicated by comments:</p> <pre> public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = first; // line 1 for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) // line 2 bestSoFar = y[i]; // line 3 } // for return bestSoFar; // line 4 } // method minVal </pre> <p>Which one of the four lines indicated by the comments contains the logic error?</p>
A	line 1
B	line 2
C	line 3
D	line4
Explanation	<p>line 2 should be <code>if (y[i] < bestSoFar)</code></p> <p>The > sign in this buggy line is looking for the MAXIMUM value in the array.</p>
Tags	Nested-Block-Depth-2-two-nested, Skill-DebugCode, ATT-Transition-DefineCSspeak, Contributor_Raymond_Lister, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Neo-Piaget-3-Concrete_Operational, ConceptualComplexity-2-Medium

Field	Value
ID	632768 [created: 2013-06-20 04:47:57, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following code for a method "minVal" contains a logic error on a single line in the method body, on one of the four lines indicated by comments:</p> <pre> public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; // line 1 for (int i=first+1; i<=last; i++) { if (bestSoFar < y[i]) // line 2 bestSoFar = y[i]; // line 3 } // for return bestSoFar; // line 4 } // method minVal </pre> <p>Which one of the four lines indicated by the comments contains the logic error?</p>

A	line 1
B	line 2
C	line 3
D	line 4
Explanation	line 2 should be if (bestSoFar > y[i]) The < sign in this buggy line is looking for the MAXIMUM value in the array.
Tags	Nested-Block-Depth-2-two-nested, Skill-DebugCode, ATT-Transition-DefineCSspeak, Contributor_Raymond_Lister, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Neo-Piaget-3-Concrete_Operational, ConceptualComplexity-2-Medium

Field	Value
ID	632792 [created: 2013-06-20 08:22:54, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	Does this compile? <code>int x=7.0</code>
A	yes
B	no
C	It depends on the version of the compiler
Explanation	This doesn't compile. Although 7.0 could be converted to an integer without loss of precision, Java will not perform any conversion of a double to an int without an explicit cast by the programmer.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632793 [created: 2013-06-20 08:28:09, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	What does this print? <pre>double d = 8 / 10; System.out.println(d);</pre>
A	d
B	0
C	0.8
D	2
E	None of the above
Explanation	Integer division! 10 goes into 8 zero times, with a remainder of 8. But since this is integer division, we only care about the quotient, which is zero!
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632796 [created: 2013-06-20 08:36:08, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignments <code>x = 27</code> and <code>y = 12</code> , what is returned by <code>x%y</code> ?
A	2
B	2.25

C	3
D	3.0
E	None of the above
Explanation	The % operation performs "mod" (modular division), which means "do the division but return the remainder rather than the quotient".
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, Bloom-2-Comprehension, Language-Python, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632800 [created: 2013-06-20 08:47:08, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	After the assignments <code>x = 27</code> and <code>y = 12</code> , what is returned by <code>not x <= y < x + y</code> ?
A	True
B	False
C	1
D	0
E	An error
Explanation	Python has an incredibly flexible syntax which allows expressions like <code>x <= y < x + y</code> (this statement would not compile in many other languages). If we break this expression down: <code>x+y</code> is 39, so the expression is asking: <code>not 12 <= 27 < 39</code> <code>12 <= 27 < 39</code> is True, as 27 is in fact between 12 and 39. And if we apply not to True, we get False.
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-ArithmeticOperators, Block-Vertical-1-Atom, Bloom-2-Comprehension, Language-Python, TopicSimon-LogicalOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632804 [created: 2013-06-20 08:53:48, author: jspacco (xjaime), avg difficulty: 0.0000]
Question	Which of the following assertions about the effect of <code>int(my_var)</code> is correct?
A	It modifies the value of <code>my_var</code> , truncating it to make it an integer.
B	It returns <code>True</code> if <code>my_var</code> is an integer; and <code>False</code> , otherwise.
C	It produces an error if <code>my_var</code> is not an integer.
D	It returns the integer representation of the value associated with <code>my_var</code> , or an error
E	None of the above
Explanation	A is wrong because the <code>int()</code> function does not modify (mutate) its parameter B is wrong because the <code>int()</code> function does not return a Boolean, it returns an <code>int()</code> C is wrong because the <code>int()</code> function works with double/float inputs, which are not ints (although it will generate an error if invoked with a String, for example) D is correct! <code>int()</code> converts ints and doubles to an int, truncating any extra information (i.e. the decimal portion of a double), and will generate an error if called with a non-numeric value
Tags	ATT-Transition-ApplyCode, Contributor_Jaime_Spacco, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-1-Atom, TopicSimon-DataTypesAndVariables, TopicWG-Numeric-Float-Precision, Bloom-2-Comprehension, Language-Python, TopicWG-Numeric-Float-Rounding, LinguisticComplexity-1-Low, CodeLength-lines-00-to-06_Low, Nested-Block-Depth-0-no_ifs_loops

Field	Value

ID	632806 [created: 2013-05-24 09:01:48, author: crjjrc (xchris), avg difficulty: 0.0000]
Question	<p>The following methods are in Java's String class:</p> <ul style="list-style-type: none"> • <code>int indexOf(int ch)</code> - Returns the index within this string of the first occurrence of the specified character. • <code>int indexOf(int ch, int fromIndex)</code> - Returns the index within this string of the first occurrence of the specified character, starting the search at the specified index. • <code>String substring(int beginIndex, int endIndex)</code> - Returns a new string that is a substring of this string. The substring begins at the specified <code>beginIndex</code> and extends to the character at index <code>endIndex - 1</code>. Thus the length of the substring is <code>endIndex - beginIndex</code>. <p>Given these specifications, what does the following code print?</p> <pre>String s = "ichi,ni,san,go"; int i1 = s.indexOf(','); int i2 = s.indexOf(',', i1); System.out.println(s.substring(i1, i2));</pre>
A	<input type="radio"/> "ni"
B	<input type="radio"/> The empty string
C	<input type="radio"/> ","
D	<input type="radio"/> ",ni"
E	<input type="radio"/> ",ni,"
Explanation	i1 is 4, and so is i2, since the second <code>indexOf</code> call begins searching at the position of the same comma that was found by the first <code>indexOf</code> call. Calling <code>substring</code> with identical parameters yields a 0-length String.
Tags	Contributor_Chris_Johnson, ATT-Transition-ApplyCode, Skill-Trace_IncludesExpressions, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, CS1, LinguisticComplexity-1-Low, TopicSimon-Params-SubsumesMethods, CodeLength-lines-00-to-06_Low, ConceptualComplexity-1-Low, TopicSimon-Strings, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632757 [created: 2013-06-20 01:03:35, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "minPos":</p> <pre>public static int minPos(int[] y, int first, int last) { /* This method returns the position of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = first; xxx missing for loop goes here return bestSoFar; } // method minPos</pre> <p>In this question, the missing "for" loop is to run "backwards". That is, the code should search the array from the high subscripts to the low subscripts. Given that, the correct code for the missing "for" loop is:</p>
A	<pre>for (int i=last; i>first; i--) { if (y[bestSoFar] < y[i]) { bestSoFar = i; } // if } // for</pre>
B	<pre>for (int i=first+1; i<=last; i++) { if (y[bestSoFar] < y[i]) { bestSoFar = i; } // if } // for</pre>
C	<pre>for (int i=last; i>first; i--) { if (y[bestSoFar] < y[i]) { bestSoFar = i; } // if } // for</pre>

D	<pre> for (int i=last; i>first; i--) { if (y[i] < y[bestSoFar]) { bestSoFar = i } // if } // for </pre>
E	<pre> for (int i=first+1; i<=last; i++) { if (bestSoFar < y[i]) { bestSoFar = i; } // if } // for </pre>
Explanation	<p>a) INCORRECT: if (y[bestSoFar] < y[i]) ... This is setting bestSoFar to the index of the LARGEST number so far.</p> <p>b) INCORRECT: The loop starts at first+1 ...not running backwards. This loop is if (y[bestSoFar] < y[i]) ... This is setting bestSoFar to the index of the LARGEST number so far.</p> <p>c) INCORRECT: if (y[bestSoFar] < y[i]) ... This is setting bestSoFar to the index of the LARGEST number so far.</p> <p>d) CORRECT!</p> <p>e) INCORRECT: The if statement compares y[i] with the integer bestSoFar, not what is in the array at the position bestSoFar. The loop starts at first+1 ... This loop is not running backwards.</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium

Field	Value
ID	632756 [created: 2013-06-20 01:30:36, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton <code>for</code> a method called <code>"minPos"</code>:</p> <pre> public static int minPos(int[] y, int first, int last) { /* This method returns the position of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = first; xxx missing for loop goes here return bestSoFar; } // method minPos </pre> <p>In <code>this</code> question, the missing <code>"for"</code> loop is to run <code>"forwards"</code>. That is, the code should search the array from the high subsc</p>
A	<pre> for (int i=last; i>first; i--) { if (y[bestSoFar] < y[i]) { bestSoFar = i; } // if } // for </pre>
B	<pre> for (int i=first+1; i<=last; i++) { if (y[bestSoFar] > y[i]) { bestSoFar = i; } // if } // for </pre>

	<pre> } // if } // for</pre>
C	<pre>for (int i=last; i>first; i--) { if (y[bestSoFar] > y[i]) { bestSoFar = i; } // if } // for</pre>
D	<pre>for (int i=last; i>first; i--) { if (bestSoFar < y[i]) { bestSoFar = i } // if } // for</pre>
E	<pre>for (int i=first+1; i<=last; i++) { if (bestSoFar > y[i]) { bestSoFar = i; } // if } // for</pre>
Explanation	<p>a) INCORRECT: The loop starts at last ... This loop is not running forwards. if (y[bestSoFar] < y[i]) ... This is setting bestSoFar to the index of the LARGEST number so far.</p> <p>b) CORRECT!</p> <p>c) INCORRECT: The loop starts at last ... This loop is not running forwards.</p> <p>d) INCORRECT: The loop starts at last ... This loop is not running forwards. The if statement compares y[i] with the integer bestSoFar, not what is in the array at the position bestSoFar.</p> <p>e) INCORRECT: The if statement compares y[i] with the integer bestSoFar, not what is in the array at the position bestSoFar. The loop starts at first+1 ... This loop is not running forwards.</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium

Field	Value
ID	632334 [created: 2013-06-18 12:34:06, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>Assume this Perl subroutine is called like this:</p> <pre>&compare(6,4); sub compare { my \$ret = 0; if(\$_[0] > \$_[1]) { \$ret = 1; } elsif(\$_[0] < \$_[1]) { \$ret = -1; } }</pre>

	<pre>return \$ret; }</pre> <p>What will the subroutine return?</p>
A	-1
B	0
C	1
D	undef
Explanation	6 (the first parameter) is greater than 4 (the second parameter) so it returns 1
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-2-Struct_Control, Block-Vertical-2-Block, Bloom-2-Comprehension, Language-Perl, CSother, CodeLength-lines-06-to-24_Medium, TopicSimon-SelectionSubsumesOps

Field	Value
ID	632343 [created: 2013-06-18 15:39:56, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>In this question, you are given a Perl regular expression that you are required to evaluate.</p> <p>There are no leading or trailing spaces in any of the text, nor are there any spaces in the regex.</p> <p>Identify the answer which best matches the regex below:</p> <p>/write/</p>
A	Write your name at the top.
B	Your writing is hard to read.
C	Did you write your ID on the paper?
D	Who sends handwritten letters anymore?
Explanation	The expression generates a match for a sentence which contains the full string (case sensitive) given between the / / delimiters
Tags	Skill-PureKnowledgeRecall, Contributor_Tony_Clear, Difficulty-1-Low, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Perl, CSother, CodeLength-lines-00-to-06_Low, TopicSimon-Strings

Field	Value
ID	632355 [created: 2013-06-18 15:56:07, author: tclear (xtony), avg difficulty: 0.0000]
Question	<p>In this question, you are given a Perl regular expression that you are required to evaluate.</p> <p>There are no leading or trailing spaces in any of the text, nor are there any spaces in the regex.</p> <p>Identify the answer which best matches the regex below:</p> <p>/^[A-Z]\d/</p>
A	ABC123
B	X3g5.
C	3Y3
D	a5D2
Explanation	Must begin with an upper case letter followed by a digit.
Tags	Contributor_Tony_Clear, Skill-Trace_IncludesExpressions, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, Block-Vertical-1-Atom, Bloom-1-Knowledge, Language-Perl, CSother, CodeLength-lines-00-to-06_Low, TopicSimon-Strings

Field	Value
ID	632468 [created: 2013-06-19 04:07:05, author: kate (xkate), avg difficulty: 0.0000]
Question	An example of something that could be built using a ListADT is a structure that models:

A	The undo operation in a word processor
B	The back button in a web browser
C	the customers waiting to pay at the university dining hall
D	an ordered to-do list
E	the computers at the university and the network that connects them
Explanation	<p>In ListADT, items can be added to or removed from the beginning, middle, or end of the structure. This is not well suited for choices A or B, where you need to remove only the most recently added item.</p> <p>For choice C, you need to ensure that the item removed is always the one that was stored first, so ListADT won't work there either.</p> <p>Choice E would be best modeled by a nonlinear structure, and ListADT (like StackADT and QueueADT) is linear.</p> <p>That leaves Choice D. A list of things to do can be linear -- one thing after another -- and it may be desirable to add new items at the beginning, middle, or end, depending on how important they are.</p>
Tags	Contributor_Kate_Sanders, TopicWG-ADT-List-DefInterfaceUse, ATT-Transition-CSspeak_to_English, Skill-DesignProgramWithoutCoding, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-2-Medium, Block-Vertical-4-Macro-Structure, Bloom-4-Application, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicSimon-ProgramDesign, ConceptualComplexity-2-Medium, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632469 [created: 2013-06-19 04:20:10, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Identify the bug in the following code (if any):</p> <pre>public boolean search(T item, MyList<T> list){ // 1 this.search(item, list.getRest()); // 2 } // 3</pre>
A	There is no base case
B	The problem is not self-similar
C	There is a base case, but the problem does not get smaller
D	There are no bugs
E	None of the above
Explanation	<p>For a recursive solution to a problem, you need three things:</p> <ul style="list-style-type: none"> (1) a base case (where the problem can be solved without recursion) (2) a self-similar problem (one that contains similar problem(s) to itself) (3) a way of making the problem smaller so you get closer to the base case <p>Here (2) is satisfied -- lists contain smaller lists. (3) is satisfied by line 2 of the method. But there is no base case.</p>
Tags	Contributor_Kate_Sanders, Skill-DebugCode, ATT-Transition-Code_to_CSspeak, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-00-to-06_Low, TopicSimon-Recursion, ConceptualComplexity-2-Medium, Nested-Block-Depth-1

Field	Value
ID	632475 [created: 2013-06-19 04:33:18, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>Identify the bug in the following code (if any):</p> <pre>public boolean search(T item, ListADT list){ // 1 if (list == null) // 2 return false; // 3 else if (list.first()==item) // 4 return true; // 5 else // 6 return this.search(item, list); // 7</pre>

	<code>} // 8</code>
A	There is no base case
B	The problem is not self-similar
C	The problem does not get smaller
D	There are no bugs
E	None of the above
Explanation	<p>For a recursive solution to a problem, you need three things:</p> <p>(1) a base case (where the problem can be solved without recursion)</p> <p>(2) a self-similar problem (one that contains similar problem(s) to itself)</p> <p>(3) a way of making the problem smaller so you get closer to the base case</p> <p>Here (2) is satisfied -- lists contain smaller lists. (1) is satisfied by lines 2-5 of the method. But the recursive call in line 7 has the same parameter as the method itself (line 1), so the problem never gets smaller.</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, Skill-DebugCode, ATT-Transition-Code_to_CSspeak, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	632476 [created: 2013-06-19 05:09:55, author: kate (xkate), avg difficulty: 0.0000]
Question	<p>The worst-case time complexity of the following Java method is:</p> <pre> public int fibonacci (int n) { if (n == 1) return 1; else if (n == 2) return 1; else if (n > 2) return fibonacci(n-1)+fibonacci(n-2); else return -1; // invalid input } </pre>
A	O(1)
B	O(log n)
C	O(n)
D	O(n ²)
E	none of the above
Explanation	This code is exponential, because it's doubly recursive.
Tags	Nested-Block-Depth-2-two-nested, Contributor_Kate_Sanders, ATT-Transition-Code_to_CSspeak, ATT-Type-How, SkillWG-AnalyzeCode, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-2-Medium, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, LinguisticComplexity-1-Low, CS2, CodeLength-lines-06-to-24_Medium, TopicSimon-Recursion, ConceptualComplexity-2-Medium

Field	Value
ID	632565 [created: 2013-06-19 13:46:30, author: kate (xkate), avg difficulty: 0.0000]
Question	The worst-case time complexity of quicksort is:
A	O(1)
B	O(n)
C	O(n log n)

D	$O(n^2)$
E	none of the above
Explanation	<p>In the worst case, every time we partition the list, we divide it into two parts, one of size 0 and one of size $n-1$ (plus the pivot element). This would happen, for example, if all the elements of the list are equal, or if the list is already sorted and you choose the left-most element as your pivot.</p> <p>We'd have to partition the list n times, because each time the pivot element is the only one that gets put in place. The first time we compare the pivot element with all $n-1$ other elements. The second time, we compare the new pivot with $n-2$ other elements, and so forth down to $n - (n-1)$. So we do work proportional to $1+2+3+\dots+(n-1)$, or $n(n-1)/2$.</p>
Tags	ATT-Transition-ApplyCSspeak, Contributor_Kate_Sanders, Skill-PureKnowledgeRecall, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-1-Struct_Text, TopicSimon-AlgorithmComplex-BigO, ExternalDomainReferences-1-Low, Block-Vertical-2-Block, Bloom-1-Knowledge, Language-none-none-none, LinguisticComplexity-1-Low, CS2, CodeLength-NotApplicable, TopicWG-Sorting-Quadratic, Nested-Block-Depth-0-no_ifs_loops

Field	Value
ID	632743 [created: 2013-06-20 03:25:02, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "minVal":</p> <pre>public static int minVal(int[] y, int first, int last) {</pre> <div> <pre>/* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first];</pre> </div> <pre>xxx missing for loop goes here</pre> <pre>return bestSoFar;</pre> <pre>} // method minVal</pre> <p>In this question, the missing "for" loop is to run "forwards". That is, the code should search the array from the low subscripts to the high subscripts. Given that, the correct code for the missing "for" loop is:</p>
A	<pre>for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { bestSoFar = y[i]; } // if } // for</pre>
B	<pre>for (int i=first+1; i<=last; i++) { if (y[i] > y[bestSoFar]) { bestSoFar = y[i]; } // if } // for</pre>
C	<pre>for (int i=last; i>first; i--) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for</pre>
D	<pre>for (int i=last; i>first; i--) { if (bestSoFar < y[i]) { bestSoFar = i; } // if } // for</pre>
E	<pre>for (int i=first+1; i<=last; i++) { if (y[i] < bestSoFar) { bestSoFar = y[i]; } // if } // for</pre>

Explanation	<p>a) INCORRECT The loop starts at last ... This loop is not running backwards.</p> <p>b) INCORRECT: if (y[i] > y[bestSoFar]) ... bestSoFar is storing a value, not a position. In any event, this if condition is searching for the maximum value.</p> <p>c) INCORRECT: The loop starts at last ... This loop is not running backwards. if (y[i] > y[bestSoFar]) ... bestSoFar is storing a value, not a position. In any event, this if condition is searching for the maximum value. bestSoFar = i; ... bestSoFar is being set to the position, not the value.</p> <p>d) INCORRECT: The loop starts at last ... This loop is not running backwards. if (bestSoFar < y[i]) ... this if condition is searching for the maximum value. bestSoFar = i; ... bestSoFar is being set to the position, not the value.</p> <p>e) CORRECT!</p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational

Field	Value
ID	632753 [created: 2013-06-20 03:09:31, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "minVal":</p> <pre> public static int minVal(int[] y, int first, int last) { /* This method returns the value of the minimum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; xxx missing for loop goes here return bestSoFar; } // method minVal </pre> <p>In this question, the missing "for" loop is to run "backwards". That is, the code should search the array from the high subscripts to the low subscripts. Given that, the correct code for the missing "for" loop is:</p>
A	<pre> for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { bestSoFar = y[i]; } // if } // for </pre>
B	<pre> for (int i=first+1; i<=last; i++) { if (y[i] > y[bestSoFar]) { bestSoFar = y[i]; } // if } // for </pre>
C	<pre> for (int i=last; i>first; i--) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for </pre>
D	

	<pre> for (int i=last; i>first; i--) { if (bestSoFar < y[i]) { bestSoFar = i } // if } // for </pre>
E	<pre> for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) { bestSoFar = i; } // if } // for </pre>
Explanation	<p>a)</p> <p>CORRECT!</p> <p>b)</p> <p>INCORRECT:</p> <p>The loop starts at first+1 ... This loop is not running backwards.</p> <p>if (y[i] > y[bestSoFar]) ... bestSoFar is storing a value, not a position. In any event, this if condition is searching for the maximum value.</p> <p>c)</p> <p>INCORRECT:</p> <p>if (y[i] > y[bestSoFar]) ... bestSoFar is storing a value, not a position. In any event, this if condition is searching for the maximum value.</p> <p>bestSoFar = i; ... bestSoFar is being set to the position, not the value.</p> <p>d)</p> <p>INCORRECT:</p> <p>if (bestSoFar < y[i]) ... this if condition is searching for the maximum value.</p> <p>bestSoFar = i; ... bestSoFar is being set to the position, not the value.</p> <p>e)</p> <p>INCORRECT:</p> <p>The loop starts at first+1 ... This loop is not running backwards.</p> <p>if (y[i] > y[bestSoFar]) ... this if condition is searching for the maximum value.</p> <p>bestSoFar = i; ... bestSoFar is being set to the position, not the value.</p>
Tags	<p>Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-3-Analysis, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium</p>

Field	Value
ID	632754 [created: 2013-06-20 02:37:58, author: ray (ray), avg difficulty: 0.0000]
Question	<p>The following is a skeleton for a method called "maxVal":</p> <pre> public static int maxVal(int[] y, int first, int last) { /* This method returns the value of the maximum element in the * subsection of the array "y", starting at position * "first" and ending at position "last". */ int bestSoFar = y[first]; xxx missing for loop goes here return bestSoFar; } // method maxVal </pre> <p>In this question, the missing "for" loop is to run "forwards". That is, the code should search the array from the low subsc</p>
A	<pre> for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { </pre>

	<pre> bestSoFar = y[i]; } // if } // for</pre>
B	<pre>for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) { bestSoFar = y[i]; } // if } // for</pre>
C	<pre>for (int i=last; i>first; i--) { if (y[i] > y[bestSoFar]) { bestSoFar = i; } // if } // for</pre>
D	<pre>for (int i=last; i>first; i--) { if (y[i] < bestSoFar) { bestSoFar = i; } // if } // for</pre>
E	<pre>for (int i=first+1; i<=last; i++) { if (y[i] > bestSoFar) { bestSoFar = i; } // if } // for</pre>
Explanation	<p>a)</p> <p>INCORRECT:</p> <p>The loop starts at <code>last ... it is NOT running forward.</code></p> <p>if (y[i] < y[bestSoFar]) ... This is setting bestSoFar to the value of the SMALLEST number so far.</p> <p>b)</p> <p>CORRECT!</p> <p>c)</p> <p>CORRECT:</p> <p>The loop starts at <code>last ... it is NOT running forward.</code></p> <p>if (y[i] > y[bestSoFar]) ... bestSoFar is storing the minimum value, NOT the position of the minimum value.</p> <div><pre>bestSoFar = i ... bestSoFar is being set to a position, not the value at that position.</pre></div> <p>d)</p> <p>INCORRECT:</p> <p>The loop starts at <code>last ... it is NOT running forward.</code></p> <p>if (y[i] < bestSoFar) ... This is looking for the SMALLEST value.</p> <div><pre>bestSoFar = i ... bestSoFar is being set to a position, not the value at that position.</pre></div> <p>e)</p> <p>INCORRECT:</p> <p>b <code>estSoFar = i ... bestSoFar is being set to a position, not the value at that position.</code></p>
Tags	Nested-Block-Depth-2-two-nested, Contributor_Raymond_Lister, ATT-Transition-English_to_Code, Difficulty-2-Medium, Block-Horizontal-2-Struct_Control, ExternalDomz LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, Neo-Piaget-2-Preoperational, ConceptualComplexity-2-Medium

Field	Value
ID	632808 [created: 2013-05-24 00:08:46, author: crjirc (xchris), avg difficulty: 0.0000]
Question	Suppose you have the following partial code to sum up an array of <code>int</code> s:

```
int sum(int[] nums) {
    int sum = 0;
    ...
    return sum;
}
```

Which of the following *does not* correctly complete this method?

A

```
for (int i = 0; i < nums.length; ++i)
    sum += nums[i];
```

B

```
for (int i : nums)
    sum += i;
```

C

```
for (int i = nums.length - 1; i >= 0; ++i)
    sum += nums[i];
```

D

```
int i = 0;
while (i < nums.length) {
    sum += nums[i];
    ++i;
}
```

Explanation

It appears in this solution that we are iterating through the list in reverse. However, we incorrectly increment the iterator, leading to an `IndexOutOfBoundsException`.

Tags

Contributor_Chris_Johnson, ATT-Transition-ApplyCode, Skill-WriteCode_MeansChooseOption, ATT-Type-How, Difficulty-1-Low, Block-Horizontal-1-Struct_Text, ExternalDomainReferences-1-Low, TopicSimon-Arrays, Block-Vertical-2-Block, Language-Java, Bloom-2-Comprehension, TopicSimon-LoopsSubsumesOperators, CS1, LinguisticComplexity-1-Low, CodeLength-lines-06-to-24_Medium, ConceptualComplexity-1-Low, Nested-Block-Depth-1