

632805 2

Which data structure used to implement Set yields the worst performance for Set.contains?

- a. Binary search tree
- *b. Linked list
- c. Sorted array
- d. Hashtable
- e.
- f. "
- g. "
- h. "
- i. "

General Feedback:

Implementing Set.contains 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.

633246 2

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
- f. "
- g. "
- h. "
- i. "
- j. "

General Feedback:

A vertex with an edge to itself is a cycle.

634254 2

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. counter
- b. true
- c. false
- *d. totalA
- e. aString
- f. "
- g. "
- h. "
- i. "
- j. "

General Feedback:

The return type of the method is `int`, so an integer return value must be provided. Since `counter` is used as a loop index, it will always end up being the total number of characters in the given string. The variable `totalA` 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.