

## Practice Quiz Test-5 (CSW 2)

Total points 10/10

- ✓ Suppose  $A[ ] = <0, 1, 2, 0, 2, 1, 1>$  and the pivotindex is 1, then apply the Dutch National Flag algorithm to reorder the array. What is the final output after applying the algorithm? \*

- [0, 1, 2, 0, 2, 1, 1]
- [0, 0, 1, 1, 2, 2] ✓
- [0, 0, 1, 1, 2, 2, 1]
- [1, 0, 0, 1, 1, 2, 2]

- ✓ Suppose ArrayList = [WHITE, BLUE, WHITE, BLUE, RED, RED] and the pivotindex is 1, then apply the Dutch National Flag algorithm to reorder the ArrayList. What is the final output after applying the algorithm? \*

- [WHITE, BLUE, WHITE, BLUE, RED, RED]
- [RED, RED, BLUE, WHITE, BLUE, WHITE]
- [WHITE, WHITE, RED, RED, BLUE, BLUE] ✓
- [RED, RED, WHITE, WHITE, BLUE, BLUE]

- ✓ What is the time complexity of accessing an element in ArrayList? \*

- O(n)
- O(1) ✓
- O(nlogn)
- O(2)

- ✓ What is the time complexity of the Dutch National Flag algorithm, where we make a single pass and move all the elements less than the pivot to the beginning and in the second pass we move the larger elements to the end. \*

- O(1)
- O(N) ✓
- O(N\*N)
- O(N\*M)

- ✓ Apply Quick sort ascending order on a given sequence 5, 3, 6, 7, 9, 2, 8, 4. 2/2  
What is the sequence after first phase, if pivot is the last element? \*

- 5, 3, 6, 7, 9, 2, 8, 4
- 2, 3, 4, 5, 6, 7, 8, 9
- 7, 9, 5, 8, 6, 4, 2, 3
- 3, 2, 4, 7, 9, 5, 8, 6 ✓

## Practice Quiz Test-6 (CSW 2)

Total points 15/15

✓ What is the order of variables in Enum? \*

2/2

- Ascending order ✓
- Descending order
- Random order
- Depends on the order() method

✓ What will be the output of the following Java code? \*

2/2

```
enum Season
{
    WINTER, SPRING, SUMMER, FALL
};

System.out.println(Season.WINTER.ordinal());
```

- 1  0 ✓  
 1  
 2  
 3

✓ What will be the output of the following code? \*

5/5

```
public class Test {
    public static void dutchFlagPartition(int pivotIndex,
                                         List<Integer> A) {
        int pivot = A.get(pivotIndex);
        for (int i = 0; i < A.size(); i++) {
            for (int j = i + 1; j < A.size(); j++) {
                if (A.get(j) < pivot) {
                    Collections.swap(A, i, j);
                    break;
                }
            }
            for (int k = A.size() - 1; k >= 0 && A.get(k) >= pivot; k--) {
                if (A.get(k) >= pivot) {
                    Collections.swap(A, i, k);
                    break;
                }
            }
        }
    }

    public static void main(String[] args) {
        ArrayList<Integer> el = new ArrayList<>();
        el.add(0);
        el.add(1);
        el.add(2);
        el.add(1);
        el.add(2);
        el.add(1);
        el.add(2);
        System.out.println(el);
        int pivotIndex = el.indexOf(1);
        dutchFlagPartition(pivotIndex, el);
        System.out.println(el);
    }
}
```

- [0, 1, 2, 0, 2, 1, 1]
- [0, 0, 1, 1, 1, 2, 2]
- [0, 0, 1, 2, 1, 2, 1] ✓
- [1, 0, 0, 1, 1, 2, 2]
- Option 5

✓ What is the space complexity of the Dutch National Flag algorithm.

where we make a single pass and move all the elements less than the pivot to the beginning and in the second pass we move the larger elements to the end. \*

2/2

- 0(1) ✓  
 O(N)  
 O(NN)  
 O(NMM)

✓ What will be the output of the following code? \*

4/4

```
public class Test {
    public static enum Color {WHITE, RED, BLUE}
    public static void dutchFlagPartition(int pivotIndex, List<Color> A) {
        Color pivot = A.get(pivotIndex);
        int smaller = 0, equal = 0, larger = A.size() - 1;
        while (equal <= smaller && equal <= larger) {
            if (A.get(equal).ordinal() < pivot.ordinal()) {
                Collections.swap(A, smaller, equal);
            }
            else if (A.get(equal).ordinal() == pivot.ordinal()) {
                equal++;
            }
            else { // A got (equal) > pivot.
                Collections.swap(A, equal, larger);
            }
        }
    }

    public static void main(String[] args) {
        ArrayList<Color> al = new ArrayList<>();
        al.add(Color.RED);
        al.add(Color.RED);
        al.add(Color.BLUE);
        al.add(Color.BLUE);
        al.add(Color.BLUE);
        al.add(Color.BLUE);
        al.add(Color.BLUE);
        al.add(Color.RED);
        al.add(Color.RED);
        System.out.println(al);
        int pivotIndex = al.indexOf(Color.RED);
        dutchFlagPartition(pivotIndex, al);
        System.out.println(al);
    }
}
```

- [RED, RED, WHITE, BLUE, WHITE, BLUE, RED, RED]
- [WHITE, WHITE, BLUE, RED, BLUE, RED, RED, RED]
- [WHITE, WHITE, RED, RED, RED, BLUE, BLUE] ✓
- [RED, RED, RED, RED, WHITE, BLUE, BLUE]

## Practice Quiz Test-8 (CSW 2)

Total points 15/15

- ✓ What is the time complexity of a program that takes two arrays  $\text{Arr1}[n]$  and  $\text{Arr2}[m]$  representing integers, and returns an integer representing their product? \*

- O(1)
- O(n)
- O(m)
- O( $n \cdot m$ ) ✓

- ✓ What is the space complexity of a program that takes two arrays  $\text{Arr1}[n]$  and  $\text{Arr2}[m]$  representing integers, and returns an integer representing their product? \*

- O(n)
- O(m)
- O( $n+m$ ) ✓
- O( $n \cdot m$ )

- ✓ What is the output of a program which takes an array of n integers, where  $A[i]$  denotes the maximum you can advance from index i, and returns whether it is possible to advance to the last index starting from the beginning of the array? Let  $A = \{3, 3, 1, 0, 2, 0, 1\}$  \*

- It is not possible to reach the last index.
- It is possible to reach the last index. ✓

- ✓ What is the time complexity of the Dutch National Flag algorithm, where we make a single pass and move all the elements less than the pivot to the beginning and in the second pass we move the larger elements to the end. \*

- O(1)
- O(N) ✓
- O( $N^2$ )
- O( $N \cdot M$ )

- ✓ What is the output of a program which takes an array of n integers, where  $A[i]$  denotes the maximum you can advance from index i, and returns whether it is possible to advance to the last index starting from the beginning of the array? Let  $A = \{3, 2, 0, 0, 2, 0, 1\}$  \*

- It is not possible to reach the last index. ✓
- It is possible to reach the last index.

- ✓ What is the output of a program which takes an array of n integers, where  $A[i]$  denotes the maximum you can advance from index i, and returns whether it is possible to advance to the last index starting from the beginning of the array? Let  $A = \{2, 4, 1, 1, 0, 2, 3\}$  \*

- It is not possible to reach the last index.
- It is possible to reach the last index. ✓

- ✓ What is the minimum number of jumps required to reach the end of an Array=[2, 1, 3, 2, 3, 4, 5, 1, 2, 8], where  $A[i]$  denotes the maximum move you can advance from index i. \*

- 2
- 3 ✓
- 4
- 5

## Practice Quiz Test-9 (CSW 2)

Total points 10/20

- An array  $\text{Price} = [10, 315, 275, 295, 260, 270, 290, 230, 255, 250]$ .  
denoting the daily stock price. What is the corresponding to buying and selling one share of that stock once so that maximum profit can? \*

- Buy at price = 315 & Sell at price = 230
- Buy at price = 275 & Sell at price = 290
- Buy at price = 260 & Sell at price = 290 ✓
- Buy at price = 230 & Sell at price = 255

- An array  $\text{Price} = [10, 22, 5, 75, 65, 80]$  denoting the daily stock price. \*  
What is the maximum profit by buying and selling a share of that stock at most twice? \*

- Max profit=5
- Max profit=10
- Max profit 87 ✓
- Not possible to earn

- An array  $\text{Price} = [2, 30, 15, 10, 8, 25, 80]$  denoting the daily stock price. \*  
What is the maximum profit by buying and selling a share of that stock at most twice? \*

- Max profit=8
- Max profit=100 ✓
- Max profit=106
- Not possible to earn

- An array  $\text{Price} = [100, 30, 15, 10, 8, 25, 80]$  denoting the daily stock price. \*  
What is the maximum profit by buying and selling a share of that stock at most twice? \*

- Max profit=7 ✓
- Max profit 52
- Max profit=10
- Not possible to earn

- An array  $\text{Price} = [90, 80, 70, 60, 50]$  denoting the daily stock price. What is the maximum profit by buying and selling a share of that stock at most twice? \*

- Max profit=40
- Max profit=50
- Max profit=10
- Not possible to earn ✓

- An array  $\text{Price} = [12, 11, 13, 9, 12, 8, 14, 13, 15]$  denoting the daily stock price. What is the maximum profit by buying and selling a share of that stock at most twice? \*

- Max profit=7
- Max profit=12 ✗
- Max profit=10
- Max profit=5

Correct answer

- Max profit=10

- What is the time complexity of a program that takes an integer argument and returns all the primes between 1 and that integer using trial-division method. \*

- $O(n^2)$
- $O(\sqrt{n})$
- $O(p^3)$  ✓
- $O(n \log n)$

- What is the time complexity of a program that takes an integer argument and returns all the primes between 1 and that integer using sieve method. \*

- $O(n^2)$
- $O(n \log n)$
- $O(\log n)$
- $O(n \log \log n)$  ✓

- What is the space complexity of a program that takes an integer argument and returns all the primes between 1 and that integer using sieve method. \*

- $O(n)$  ✓
- $O(\sqrt{n})$
- $O(n \log n)$
- $O(n \log \log n)$

- A program that takes an integer argument and returns all the primes between 1 and that integer using sieve method. What is the size of a boolean array to encode the candidates, i.e., If the  $i$ th entry in the array is true, then  $i$  is potentially a prime? \*

- size =  $n$
- size =  $n+1$
- size =  $\lceil \frac{n}{2} \rceil \times \lceil \frac{n}{2} \rceil + 1$  ✓
- size =  $\lceil \frac{n}{2} \rceil \times \lceil \frac{n}{2} \rceil + 1$

**Practice Quiz Test-10 (CSW 2)** Total points 20/20

✓ Given the array $[ ] = [1,2,3,4]$  and a permutation array  $p[ ] = [3,2,1,0]$ . What is the output after permute the given array $[ ]$  based on the permutation  $p[ ]$ ? \* 2/2

(4, 3, 2, 1) ✓  
 (4, 3, 1, 2)  
 (1, 2, 3, 4)  
 (1, 2, 4, 3)

✓ Given the array $[ ] = [11,32,3,42]$  and a permutation array  $p[ ] = [2,3,0,1]$ . What is the output after permute the given array $[ ]$  based on the permutation  $p[ ]$ ? \* 2/2

(11, 32, 3, 42)  
 (3, 12, 11, 32) ✓  
 (3, 11, 32, 42)  
 (3, 11, 42, 32)

✓ Given the array $[ ] = [a,b,c,d]$  and a permutation array  $p[ ] = [2,0,1,3]$ . What is the output after permute the given array $[ ]$  based on the permutation  $p[ ]$ ? \* 2/2

(a, b, c, d)  
 (b, c, a, d)  
 (b, c, d, a) ✓  
 (b, d, c, a)

✓ Given the array $[ ] = [a,b,c,d]$  and a permutation array  $p[ ] = [3,1,2,0]$ . What is the output after permute the given array $[ ]$  based on the permutation  $p[ ]$ ? \* 2/2

(a, b, c, d)  
 (b, c, a, d)  
 (b, c, d, a)  
 (d, b, c, a) ✓

✓ Compute the next permutation of an input  $[6, 2, 1, 5, 4, 3, 0]$  under dictionary ordering.\* 2/2

(6, 2, 3, 0, 1, 4, 5) ✓  
 (6, 2, 1, 0, 3, 4, 5)  
 (6, 2, 1, 5, 4, 3, 0)  
 (6, 2, 3, 5, 4, 1, 0)

✓ Compute the next permutation of an input  $[0, 1, 2, 5, 3, 3, 0]$  under dictionary ordering.\* 2/2

(Empty)  
 (0, 1, 2, 5, 3, 3, 0)  
 (0, 1, 3, 3, 2, 0)  
 (0, 1, 3, 0, 2, 3, 5) ✓

✓ Compute the next permutation of an input  $[6, 5, 4, 3, 3, 0, 1, 2]$  under dictionary ordering.\* 2/2

(Empty)  
 (6, 5, 4, 3, 3, 0, 1, 2, 7) ✓  
 (6, 5, 4, 3, 3, 2, 2, 1, 0)  
 (6, 5, 4, 3, 3, 2, 2, 0, 1)

✓ Compute the next permutation of an input  $[9, 5, 4, 3, 1]$  under dictionary ordering.\* 2/2

(Empty) ✓  
 (9, 5, 4, 3, 1)  
 (9, 5, 4, 1, 3)  
 (9, 5, 3, 4, 1)  
 (9, 5, 3, 1, 4)

✓ A program that takes an integer argument and returns all the primes between 1 and that integer using general sieve method. What is the size of a boolean array to encode the candidates, i.e., if the  $i$ th entry in the array is true, then  $i$  is potentially a prime? \* 2/2

size = n  
 size = n+1 ✓  
 size = Math.floor(0.5 \* (n - 3)) + 1  
 size = Math.floor(0.5 \* n) + 1

✓ A program that takes an integer argument and returns all the primes between 1 and that integer using improved sieve method. What is the size of a boolean array to encode the candidates, i.e., if the  $i$ th entry in the array is true, then  $i$  is potentially a prime? \* 2/2

size = n  
 size = n+1  
 size = Math.floor(0.5 \* (n - 3)) + 1 ✓  
 size = Math.floor(0.5 \* n) + 1

**Practice Quiz Test-11 (CSW 2)** Total points 20/20

✓ What is the time complexity to delete an element at index  $i$  from an ArrayList? \* 2/2

O( $n$ )  
 O(1) ✓  
 O( $n \log n$ )  
 O( $n^2$ )

✓ Given an array of non-negative integers A, you are initially positioned at the array's first index. Each element in the array represents your maximum advance length at that position. Determine if you can reach the last index. Determine the output for the input: A=[2, 3, 1, 1, 4]. \* 2/2

True ✓  
 False

✓ Given an array of non-negative integers A, you are initially positioned at the array's first index. Each element in the array represents your maximum advance length at that position. Determine if you can reach the last index. Determine the output for the input: A=[3, 2, 1, 0, 4]. \* 2/2

True  
 False ✓

✓ You are given an array of prices where  $\text{prices}[i]$  is the price of a given stock on the  $i$ th day. Find the maximum profit you can achieve by buying and selling a stock once and twice, respectively. If you cannot achieve any profit, return 0. Input: prices = [12, 11, 13, 9, 12, 8, 14, 13, 15] \* 2/2

6, 9  
 7, 10 ✓  
 8, 9  
 8, 10

✓ Compute the next permutation of an input [0, 1, 2, 6, 3, 3, 0] under dictionary ordering. \* 2/2

[0, 1, 4, 0, 3, 3, 5]  
 [0, 1, 2, 5, 3, 3, 0]  
 [0, 1, 1, 5, 3, 2, 0]  
 [0, 1, 3, 0, 2, 5] ✓

✓ Given an array A=[3, 7, 6, 11, 13]. How many equally likely subset of size 3 is obtained from the array A[ ]? \* 2/2

5  
 6  
 10 ✓  
 120

✓ Compute the next permutation of an input [8, 6, 5, 2, 0] under dictionary ordering. \* 2/2

[Empty] ✓  
 [8, 6, 5, 2, 0]  
 [8, 5, 6, 0, 2]  
 [8, 6, 4, 5, 0]  
 [8, 6, 2, 0, 5]

✓ What is the time complexity in offline random sampling of the input array with a size "n" and returns a subset of size "k" of the array elements? \* 2/2

O( $n$ )  
 O( $n \times k$ )  
 O( $n^m$ )  
 O(k) ✓

✓ Compute random permutations of A=[0, 1, ..., n-1] with equal probability, where n=3. Random number generator returns integers 1, 2, 3, and 3 respectively. \* 2/2

[1, 0, 2, 3]  
 [1, 2, 0, 3]  
 [1, 2, 3, 0] ✓  
 [0, 1, 2, 3]

✓ What is the output of the following code? \* 2/2

```
import java.util.*;
public class Output {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<Integer>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.add(5);
        list.add(6);
        list.add(7);
        list.add(8);
        list.add(9);
        list.add(10);
        System.out.println(list);
    }
}
```

[50=5, 20=6, 40=4, 10=1] ✓  
 [50=5, 20=2, 40=4, 10=1]  
 [50=5, 20=2, 23=6, 40=4, 10=1]  
 [50=5, 20=2, 23=6, 40=4, 20=2, 10=1]

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## Quiz Questions

In delete operation of BST, we need inorder successor (or predecessor) of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about inorder successor needed in delete operation? \*

- /
- 2

Inorder Successor is always a leaf node

Inorder successor is always either a leaf node or a node with empty left child

Inorder successor may be an ancestor of the node

Inorder successor is always either a leaf node or a node with empty right child

[Add individual feedback](#)

What does the following piece of code do? public void func(Tree root){ func(root.left());  
func(root.right()); System.out.println(root.data());}

- /
- 2

Preorder traversal

Inorder traversal

Postorder traversal

Level order traversal

[Add individual feedback](#)

How will you find the minimum element in a binary search tree? \*

- /
- 2

while(root.left() != null){root = root.right();}  
while(root.left() != null){root = root.left();}

while(root.right() != null){root = root.left();}

[Add individual feedback](#)

A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a ?

/  
2

Queue

Stack

Tree

Linked list

Add individual feedback

Let the following circular queue can accommodate maximum six elements with the following data front = 2 rear = 4 queue = \_\_\_\_\_; L, M, N, \_\_\_, \_\_\_ What will happen after ADD O operation takes place?

/  
2

front = 2 rear = 5

front = 3 rear = 5  
front = 3 rear = 4  
front = 2 rear = 4

Add individual feedback

If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed?

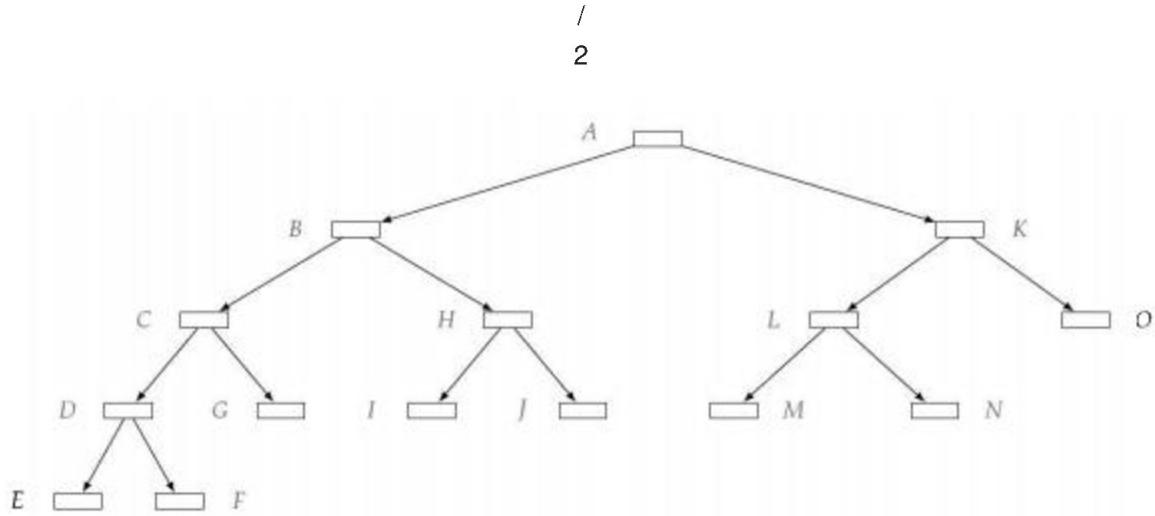
/  
2

ABCD

DCBA  
DCAB  
Option 4

Add individual feedback

Check whether the tree is height balanced



true

false

Add individual feedback

in the above tree find the height of the tree

/  
2

3  
4

5  
2

Add individual feedback

What is the code that find the height of a node

/  
2

`int height = Math.max(leftResult.height , rightResult.height) + 1;`

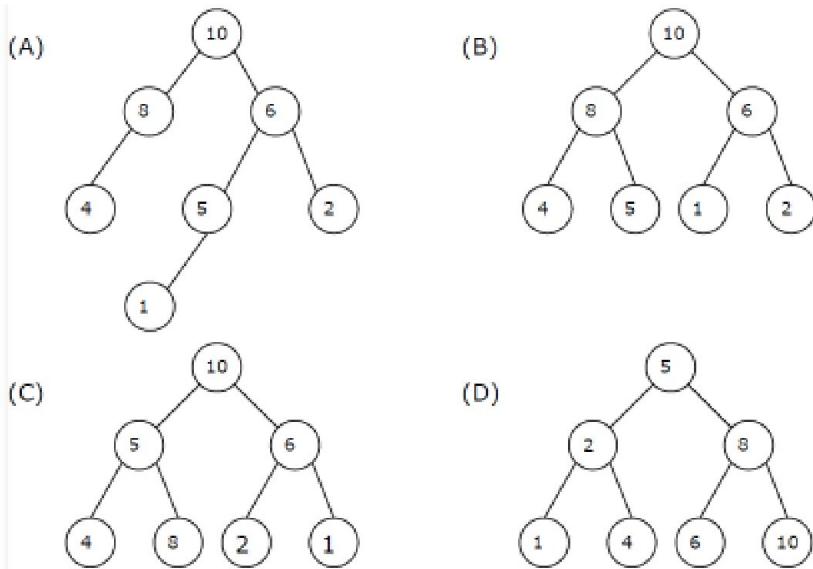
`int height = Math.max(leftResult.height , rightResult.height) - 1;`  
`int height = Math.min(leftResult.height , rightResult.height) + 1;`  
`int height = Math.min(leftResult.height , rightResult.height) - 1;`

Quiz Questions

A max-heap is a heap where the value of each parent is greater than or equal to the values of its children. Which of the following is a max-heap? \*

/

2



A  
B

C  
D

Add individual feedback

What is the complexity of adding an element to the heap?

/

2

- O(log n)
- O(log h)
- O(h)
- Both A and C

Add individual feedback

Heap can be used as \_\_\_\_\_

/  
2

Priority queue

Stack  
A decreasing order array  
ArrayList

Add individual feedback

An array consists of n elements. We want to create a heap using the elements. The time complexity of building a heap will be in order of

/  
2

$O(n^*n*\log n)$   
 $O(n*\log n)$

$O(n^*n)$   
 $O(n * \log n * \log n)$

Add individual feedback

Which one of the following array elements represents a binary min heap?

/  
2

12 ,10 ,8 ,25 ,14, 17  
8 ,10, 12 ,25, 14, 17

25 ,17, 14 ,12, 10, 8  
14 ,17, 25, 10, 12, 8

Add individual feedback

Suppose k=4, String [] s={"aaa","ab","abccca","aaccddeg"} minHeap.poll() will return which string?

/  
2

```
public static List<String> topK(int k, Iterator<String> iter) {  
    PriorityQueue<String> minHeap  
        = new PriorityQueue<>(k, new Comparator<String>() {  
            public int compare(String s1, String s2) {  
                return Integer.compare(s1.length(), s2.length());  
            }  
        });  
    while (iter.hasNext()) {  
        minHeap.add(iter.next());  
    }  
}
```

aaa  
ab

abcca  
aacddeg

Add individual feedback

Each string is processed in \_\_\_\_\_ time, which is the time to add and to remove the minimum element from the heap.

/  
2

O(log k)

O(nlogk)  
O(n)  
O(n\*n)

Add individual feedback

How would you compute the k stars which are closest to Earth?

/  
2

```
public int compare(ArrayEntry o1, ArrayEntry o2) {return Integer.compare(o1.value, o2.value);}  
public int compareTo(Star rhs) {return Double.compare(this.distance(), rhs.distance());}  
  
public int compareTo(Star rhs) {return Double.compare(this.star(), rhs.star());}
```

Add individual feedback

Construct a min heap from A[ ]={120, 140, 40, 50, 80, 70, 60, 90, 20, 100} After deleting a root element, what will be the post order traversal of the heap?

/

2

140 90 100 50 80 40 120 60 70  
140 100 80 90 120 70 50 60 40  
140 100 90 80 50 120 70 60 40

140 100 90 80 120 70 50 60 40

Correct answer

140 100 80 90 120 70 50 60 40

Add individual feedback

Heap is an example of .....\*

/

2

complete binary tree

spanning tree

sparse tree

binary search tree

Quiz Questions

11&~(11-1) \*

/

2

2

1

10

4

Add individual feedback

The parity of (11010111) is \*

/

2

```
public static short parity(long x) {  
    x ^= x >>> 32;  
    x ^= x >>> 16;  
    x ^= x >>> 8;  
    x ^= x >>> 4;  
    x ^= x >>> 2;  
    x ^= x >>> 1;
```



```
    return (short)(x & 0x1);  
}  
1  
0
```

5  
2

Add individual feedback

Extract the i-th and j-th bits of x, and see if they differ, what is the correct statement.

/  
2

$((x >>> i) \& 1) != ((x >>> j) \& 1)$

$((x << i) \& 1) != ((x << j) \& 1)$   
 $((x >>> i) \& 1) == ((x >>> j) \& 1)$

Add individual feedback

reverse(-314) is

/  
2

```
public static long reverse(int x) {  
    long result = 0;  
    long xRemaining = Math.abs(x);  
    while (xRemaining != 0) {  
        result = result * 10 + xRemaining % 10;  
        xRemaining /= 10;  
    }  
    return x < 0 ? -result : result;  
}  
413  
-413
```

312  
567

Add individual feedback

what is the output :plusOne(1,9,9)

```
/  
2  


---



```
public static List<Integer> plusOne(List<Integer> A) {  
    int n = A.size() - 1;  
    A.set(n, A.get(n) + 1);  
    for (int i = n; i > 0 && A.get(i) == 10; --i) {  
        A.set(i, 0);  
        A.set(i - 1, A.get(i - 1) + 1);  
    }  
    if (A.get(0) == 10) {  
        // Need additional digit as the most significant digit (i.e., A.get(0))  
        // has a carry-out.  
        A.set(0, 0);  
        A.add(0, 1);  
    }  
    return A;  
}
```



---


```

2,0,0

1,9,9  
1,0,0

Add individual feedback

, if  $A = (3,3,1,0,2,0,1)$ , we iteratively compute the furthest we can advance to as we can advance to and  $i + A[i]$ . What is the arraylist of the resultant furthest arraylist

/

2

0,3,4,4,4,6,6,7,

0,3,3,4,4,6,6,7,  
0,3,3,3,4,6,6,7,

Add individual feedback

consider the following sequence of stock prices: (310,315, 275, 295, 260, 270, 290, 230, 255, 250). Find the maximum profit for buy and sell once

/  
2

20  
30

10  
25

Add individual feedback

suppose the input array is (12,11,13,9,12,8,14,13,15).the maximum profit for buy and sell twice

/  
2

7  
8  
9  
10

Add individual feedback

the permutation {2,0,1,3} applied to A = {a,b,c,d} yields the array A after operation

/  
2

(b,c,a,d).

(c,b,a,d).  
(b,c,d,a).

Add individual feedback

if the input is (1,0,3, 2) compute the next permutation

/  
2

(1, 2,0,3)

(1, 2,3,0)  
(3, 2,0,1).  
(1, 0,2,3).

Add individual feedback

## Quiz Questions

Find the output for String s="-123" for (int i = s.charAt(0) == '-' ? 1 : 0; i < s.length();  
++i) {final int digit = s.charAt(i) - '0';result = result + digit; return s.charAt(0) == '-' ?  
-result : result; \*

/  
2

-123  
-6

6  
123

Add individual feedback

for the string is "615", b1 =7 and b2 = 13, then the integer value, expressed in decimal, is

/  
2

312  
245  
306

Add individual feedback

If String col="ZZ" find the result return from the function

/  
2

```
public static int ssDecodeColID(final String col) {  
    int result = 0;  
    for (int i = 0; i < col.length(); i++) {  
        char c = col.charAt(i);  
        result = result * 26 + c - 'A' + 1;  
    }  
    return result;  
}
```

670  
702

777  
701

Add individual feedback

The look-and-say sequence starts with 1. Find the 5th sequence is

/  
2

312211

132211  
312111  
312212

Add individual feedback

Which of these method of String class can be used to test two strings for equality?

/  
2

isequal()  
isequals()  
equal()  
equals()

Add individual feedback

Consider a class List that implements an unordered list. Suppose it has as its representationa singly linked list with a head and tail pointer (i.e., pointers to the first and last nodes in thelist). Given that representation, which of the following operations could be implemented in O(1)time? I. Insert item at the front of the list II. Insert item at the rear of the list III. Delete front item from list IV. Delete rear item from list

/  
2

I and II  
I and III  
I, II, and III

I, II, and IV

Add individual feedback

```
void fun1(Node head){ if(head == NULL) return; fun1(head.next); System.out.println(  
head.data);}
```

/  
2

Prints all nodes of linked lists  
Prints all nodes of linked list in reverse order

Prints alternate nodes of Linked List  
Prints alternate nodes in reverse order

Add individual feedback

Assume that reference of head of following doubly linked list is passed to above function 1 <--> 2 <--> 3 <--> 4 <--> 5 <-->6. What should be the modified linked list after the function call?

/  
2

```

void fun(Node head_ref){

    Node temp = NULL;  Node current = head_ref;

    while (current != NULL)  {

        temp = current.prev;

        current.prev = current.next;

        current.next = temp;

        current = current.prev;  }

    if(temp!=NULL)

        head_ref = temp.prev;

}

```

2 <-> 1 <-> 4 <-> 3 <-> 6 <->5  
5 <-> 4 <-> 3 <-> 2 <-> 1 <->6.  
6 <-> 5 <-> 4 <-> 3 <-> 2 <-> 1.

Add individual feedback

What is the output of following function for start pointing to first node of following linked list? 1->2->3->4->5->6

/  
2

```

void fun(struct node* start){

if(start==NULL)  return;

System.out.println( start.data); |

if(start.next!=NULL )

fun(start.next.next);

System.out.println( start.data);

}

```

1 4 6 6 4 1  
1 3 5 1 3 5  
1 2 3 5  
1 3 5 5 3 1

Add individual feedback

Find the output of the following prefix expression. \*+2-2 1/-4 2+-5 3 1

/

2

2

12

10

4

Add individual feedback

Suppose a circular queue of capacity  $(n - 1)$  elements is implemented with an array of  $n$  elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, REAR = FRONT= 0. The conditions to detect queue full and queue empty are

/

2

Full:  $(\text{REAR}+1) \bmod n == \text{FRONT}$ , empty:  $\text{REAR} == \text{FRONT}$

Full:  $(\text{REAR}+1) \bmod n == \text{FRONT}$ , empty:  $(\text{FRONT}+1) \bmod n == \text{REAR}$

Full:  $\text{REAR} == \text{FRONT}$ , empty:  $(\text{REAR}+1) \bmod n == \text{FRONT}$

Full:  $(\text{FRONT}+1) \bmod n == \text{REAR}$ , empty:  $\text{REAR} == \text{FRONT}$

Add individual feedback

Consider the usual algorithm for determining whether a sequence of parentheses is balanced. What is the maximum number of parentheses that will appear on the stack AT ANY ONE TIME when the algorithm analyzes: ((())(()))

/

2

4

3

2

6

Add individual feedback

If the characters 'D', 'C', 'B', 'A' are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?

/

2

ABCD  
ABDC  
DCAB  
DCBA

Add individual feedback

What data structure is used to perform recursion?

/

2

Stack

Queue  
Linked List  
Arrays

Add individual feedback

Which is/are the application(s) of stack?

/

2

Function calls  
Parentheses check  
Evaluation of arithmetic expressions  
All of the above

Add individual feedback

Quiz Questions

What is the maximum number of children that a binary tree node can have? \*

/  
2

0  
1  
2  
3

Add individual feedback

Consider a node in a binary tree is stored at `data[i]` then its right child is at

/  
2

`data[i+1]`  
`data[2i+1]`

`data[2i+2]`  
`data[i+2]`

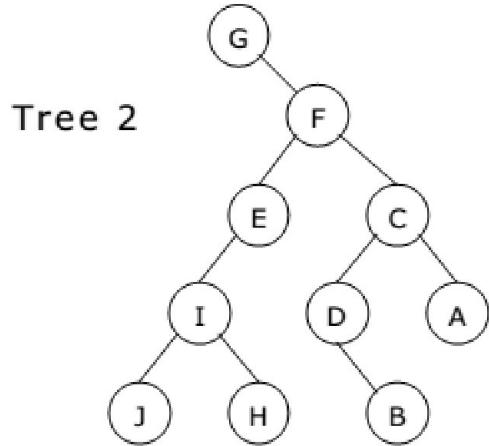
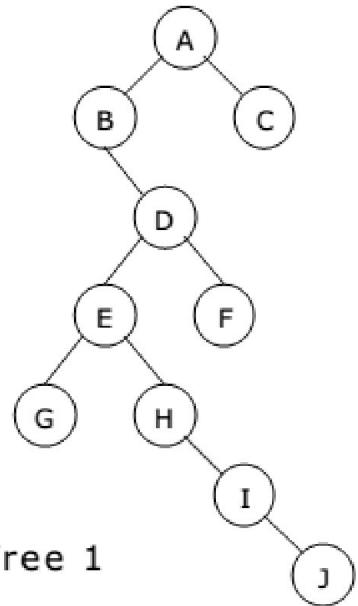
Correct answer

`data[2i+2]`

Add individual feedback

which traversal will have same sequence for tree1 and tree2?

/  
2



postorder  
postorder  
postorder  
inorder

inorder  
postorder  
inorder  
inorder

Add individual feedback

The height of a BST is given as h. Consider the height of the tree as the no. of edges in the longest path from root to the leaf. The maximum no. of nodes possible in the tree is?

/  
2

`math.pow(2,h-1)-1`  
`math.pow(2,h+1)-1`

`math.pow(2,h)-1`  
`math.pow(2,h+1)+1`

Add individual feedback

Suppose a binary tree is constructed with n nodes, such that each node has exactly either zero or two children. The maximum height of the tree will be?

/

2

$(n+1)/2$   
 $(n-1)/2$

$n/2 - 1$   
 $(n+1)/2 - 1$

Add individual feedback

Level of a node is distance from root to that node. For example, level of root is 1 and levels of left and right children of root is 2. The maximum number of nodes on level  $i$  of a binary tree is  $2^i$ . In the following answers, the operator '^' indicates power

/  
2

$2^{i-1}$

$2^i$   
 $2^{i+1}$   
 $2^{(i+1)/2}$

Add individual feedback

If level is 3 then there will be maximum how many nodes in the binary tree

/  
2

3  
5  
7

4

Add individual feedback

A full binary tree is a tree in which every node in the tree has either 0 or 2 children. Suppose root is at height 0 then minimum no of node in full binary tree of height 3 will be

/  
2

7

5

4

8

Add individual feedback

In a full binary tree, every internal node has exactly two children. A full binary tree with  $2n+1$  nodes contains

/

2

n leaf node

n internal nodes

n-1 leaf nodes

n-1 internal nodes

Add individual feedback

Which traversal reach root at last?

/

2

inorder

postorder

preorder

none of these

Add individual feedback

The balance factor of a node in a binary tree is defined as \_\_\_\_\_

/

2

addition of heights of left and right subtrees

height of right subtree minus height of left subtree

height of left subtree minus height of right subtree

height of right subtree minus one

Add individual feedback

A binary tree stored using linked representation can be converted to its mirror image by traversing it in\_\_\_\_\_.

/

2

In order.  
Preorder

Post order.  
Any order.

Add individual feedback

A full binary tree with 'n' non-leaf nodes contains \_\_\_\_\_ nodes.

/

2

$\log_2 n$   
 $n+1$ .  
 $2n$   
 $2n+1$

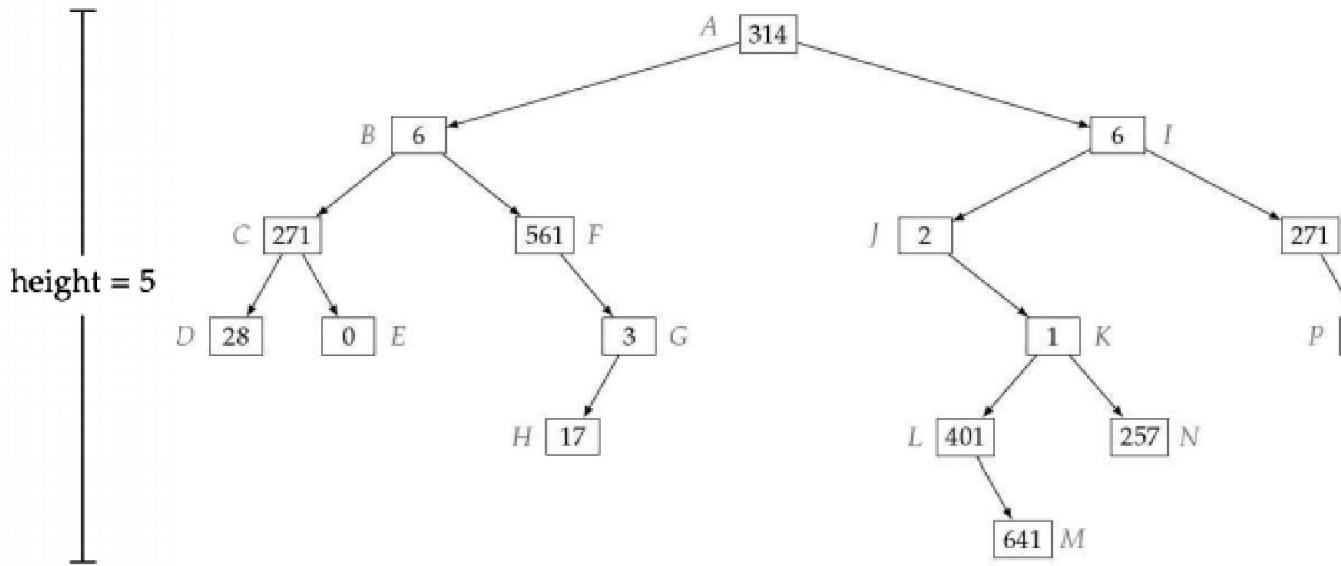
Add individual feedback

Which of the following option is preorder traversal of the below tree?

/

2

QUESTION 1: Consider the binary tree shown below. The height of a binary tree is defined as the maximum number of edges from the root to any leaf node.



(D,C,E,B, E,H, G,A,J,L, M,K,N,I,O,P).  
(A,B,C,D,E, F, G,H, I,J, K,L,M,N,O,P).

(D, E,C,H,G,F,B,M,L,N,K,J, P,O,I,A)  
(A B I C F J O D E G K P H L N M)

Add individual feedback

A binary tree is said to be height-balanced if for each node in the tree, the difference in the height of its left and right subtrees is

/  
2

atmost zero  
atmost one

atleast zero  
one

Add individual feedback

### Quiz Questions

The number of edges from the root to the node is called \_\_\_\_\_ of the tree. \*

/

2

- a) Height
- b) Depth
- c) Length
- d) Width

Add individual feedback

The number of edges from the node to the deepest leaf is called \_\_\_\_\_ of the tree. \*

/  
2

- a) Height
- b) Depth
- c) Length
- d) Width

Add individual feedback

What is a full binary tree?

/  
2

- a) Each node has exactly zero or two children
- b) Each node has exactly two children
- c) All the leaves are at the same level
- d) Each node has exactly one or two children

Add individual feedback

In a full binary tree if number of internal nodes is I, then number of leaves L are?

/  
2

- a)  $L = 2*I$
- b)  $L = I + 1$
- c)  $L = I - 1$

d)  $L = 2^I - 1$

Add individual feedback

In a full binary tree if there are L leaves, then total number of nodes N are?

/  
2

- a)  $N = 2^L$
- b)  $N = L + 1$
- c)  $N = L - 1$
- d)  $N = 2^L - 1$

Add individual feedback

## Quiz Questions

What is value of i start within for loop? What is the val of result? \*

/  
2

```
String s="-456";int result = 0;  
  
for (int i = s.charAt(0) == '-' ? 1 : 0; i < s.length(); ++i)  
{  
    final int digit = s.charAt(i) - '0';  
    result = result * 10 + digit; }  
  
return s.charAt(0) == ? -result : result;
```

0 456  
1 -456

0 -456  
1 456

Add individual feedback

For example, if the string is "615", base b1 is 7 and convert string to base b2 is 14, then the result should be

/  
2

17C

132  
1A7  
306

Add individual feedback

The bigger issue is the time-complexity—it takes 6 times of each 26 steps to get to "ZZZZZZ". In general, the time complexity is \*

/  
2

O(n)  
O(26)

$\tilde{O}(26^n)$

Option 3

O(k)

Add individual feedback

What is the col id value for String s="AAC"? \*

/  
2

702  
703

705

704

Add individual feedback

String s=""A man, a plan, a canal, Panama." Find the boolean value that is returned here based on the above input to s.

```
/  
2  
  
int i = 0, j = s.length() - 1;  
while (i < j) {  
    // i and j both skip non-alphanumeric characters.  
    while (!Character.isLetterOrDigit(s.charAt(i)) && i < j) {  
        ++i;  
    }  
    while (!Character.isLetterOrDigit(s.charAt(j)) && i < j) {  
        --j;  
    }  
    if (Character.toLowerCase(s.charAt(i++))  
        != Character.toLowerCase(s.charAt(j--))) {  
        return false;  
    }  
}  
return true;  
true  
  
false
```

Add individual feedback

What is the time complexity to reverse a set of words in a sentence?

```
/  
2  
  
O(n)  
  
O(n *n)
```

Add individual feedback

What is the next String for look and say pattern where S="111221"?

/  
3

```
private static String nextNumber(String s) {  
    StringBuilder result = new StringBuilder();  
    for (int i = 0; i < s.length(); ++i) {  
        int count = 1;  
        while (i + 1 < s.length() && s.charAt(i) == s.charAt(i + 1)) {  
            ++i;  
            ++count;  
        }  
        result.append(count);  
        result.append(s.charAt(i));  
    }  
    return result.toString();  
}
```

2112211  
312211

121112  
132211

Add individual feedback

# Practice Test

Total points 76/80



Lab Assessment

Email \*

Name \*

Registration Number \*

✓ In circular linked list, insertion of node requires modification of? \*

2/2

- One pointer
- Two pointer ✓
- Three pointer
- None
- Other:



✓ The data structure required for Breadth First Traversal on a graph is? \* 2/2

- Stack
- Queue ✓
- Tree
- Array

✓ In delete operation of BST, we need inorder successor (or predecessor) 2/2 of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about inorder successor needed in delete operation? \*

- Inorder Successor is always a leaf node
- Inorder successor is always either a leaf node or a node with empty left child ✓
- Inorder successor may be an ancestor of the node
- Inorder successor is always either a leaf node or a node with empty right child

✓ How to sort ArrayList elements? \* 2/2

- collection.sort (list);
- collections.sort (list); ✓
- Arrays.sort(list)
- Array.sort(list)



✓ Which of the following method is used to add element to map? \*

2/2

- add
- get
- put
- both a & c



✓ We can calculate the length of an array using \_\_\_\_\_. \*

2/2

- sizeof(array)
- array.len
- array.length
- array.sizeof()



✓ Which of the following traversal outputs the data in sorted order in a BST? \*

2/2

- Preorder
- Inorder
- Levelorder
- Postorder



✓ Which of the following data type(s) can store 64 bit Value.\*

2/2

- boolean
- int
- float
- long



✗ What is the worst case time complexity for search, insert and delete operations in a general Binary Search Tree? \*

0/2

- O(Logn) for all
- O(Logn) for search and insert, and O(n) for delete
- O(Logn) for search, and O(n) for insert and delete
- O(n) for all



Correct answer

- O(n) for all



✓ What is the value returned by function compareTo() if the invoking string 2/2 is less than the string compared? \*

- zero
- value less than zero
- value greater than zero
- None of the mentioned



✓ The following numbers are inserted into an empty binary search tree in 2/2 the given order: 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)? \*

- 2
- 3
- 4
- 6



✓ What will be the output of the program? \*

2/2

```
class Main {  
    public static void main(String args[]) {  
        int t;  
        System.out.println(t);  
    }  
}
```

- 0
- garbage value
- compiler error
- runtime error



✓ The preorder traversal sequence of a binary search tree is 30, 20, 10, 15, 25, 23, 39, 35, 42. Which one of the following is the postorder traversal sequence of the same tree? \*

- 10, 20, 15, 23, 25, 35, 42, 39, 30
- 15, 10, 25, 23, 20, 42, 35, 39, 30
- 15, 20, 10, 23, 25, 42, 35, 39, 30
- 15, 10, 23, 25, 20, 35, 42, 39, 30



✓ What is the output of this program? \*

2/2

```
class average {
    public static void main(String args[])
    {
        double num[] = {5.5, 10.1, 11, 12.8, 56.9, 2.5};
        double result;
        result = 0;
        for (int i = 0; i<6; ++i)
            result = result + num[i];
        System.out.print(result/6);

    }
}
```

- 16.34
- 16.56666664
- 16.46666667
- 16.76666667



✓ While inserting the elements 71, 65, 84, 69, 67, 83 in an empty binary search tree (BST) in the sequence shown, the element in the lowest level is \*

2/2

- 65
- 67
- 69
- 83



✓ Which of these class is superclass of String and StringBuffer class? \* 2/2

- java.util
- java.lang ✓
- ArrayList
- None of the mentioned

✓ What will be the output of the following Java code? \* 2/2

```
1. public class Boxer1
2. {
3.     Integer i;
4.     int x;
5.     public Boxer1(int y)
6.     {
7.         x = i+y;
8.         System.out.println(x);
9.     }
10.    public static void main(String[] args)
11.    {
12.        new Boxer1 (new Integer(4));
13.    }
14. }
```

- The value "4" is printed at the command line
- Compilation fails because of an error in line
- A NullPointerException occurs at runtime
- An IllegalStateException occurs at runtime ✓



- ✓ A binary search tree T contains n distinct elements. What is the time complexity of picking an element in T that is smaller than the maximum element in T? \*
- 2/2

- $\Theta(n \log n)$
- $\Theta(n)$
- $\Theta(\log n)$
- $\Theta(1)$



- ✓ Identify the infix expression from the list of options given below. \*
- 2/2

- $a/b + (c - d)$
- $abc^* + d + ab + cd + ^*ce - f -$
- $ab - c -$
- $+ab$



- ✓ Which of the following is not the application of stack? \*
- 2/2

- A parentheses balancing program
- Tracking of local variables at run time
- Compiler Syntax Analyzer
- Data Transfer between two asynchronous process



✓ What will be the output of the following Java code? \*

2/2

```
class output
{
    public static void main(String args[])
    {
        String a = "hello i love java";
        System.out.println(a.indexOf('i')+" "+a.indexOf('o')+" "+a.lastIndexOf('i')+" "+a.lastIndexOf('o'));
    }
}
```

- 6 4 6 9
- 5 4 5 9
- 7 8 8 9
- 4 3 6 9



✓ What will be the output of the following Java code? \*

2/2

```
public class Test{
    public static void main(String args[]){
        String s1 = "java";
        String s2 = "java";
        System.out.println(s1.equals(s2));
        System.out.println(s1 == s2);
    }
}
```

- false true
- false false
- true false
- true true



- ✓ What is the result of the following postfix expression?  $ab^*cd^*+$  where  $a=2, b=2, c=3, d=4.$  \*

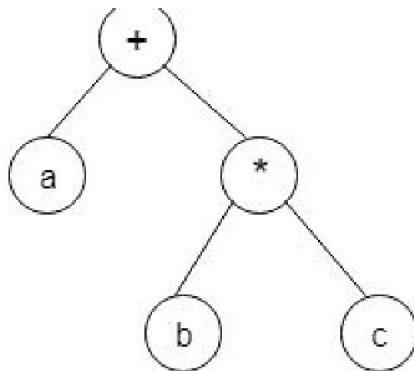
2/2

- 12
- 14
- 10
- 16



- ✓ For the given expression tree, write the correct postfix expression. \*

2/2



- abc<sup>\*</sup>+
- abc+<sup>\*</sup>
- ab+c<sup>\*</sup>
- a+bc<sup>\*</sup>



✓ Heap exhibits the property of a binary tree? \*

2/2

 true False

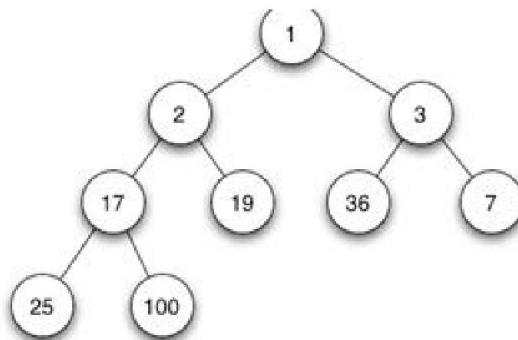
✓ What will be the output of the following Java code? \*

2/2

```
public class Test{
    public static void main(String args[]) {
        String x = "hellow";
        int y = 9;
        System.out.println(x += y);
    }
}
```

 Throws an exception as string and int are not compatible for addition hellow9 9hellow Compilation error None of these

- ✓ If we implement heap as min-heap, deleting root node (value 1) from the heap. What would be the value of root node after second iteration if leaf node (value 100) is chosen to replace the root at start. \*



- 2
- 100
- 17
- 3



✓ mWhat will be the output of the program? \*

2/2

```
class area {
    public static void main(String args[])
    {
        double r, pi, a;
        r = 9.8;
        pi = 3.14;
        a = pi * r * r;
        System.out.println(a);
    }
}
```

- 301.5656
- 301
- 301.56
- 301.57



✓ What will be the output of the following Java code? \*

2/2

```
class output
{
    public static void main(String args[])
    {
        String s1 = "Hello";
        String s2 = new String(s1);
        String s3 = "HELLO";
        System.out.println(s1.equals(s2) + " " + s2.equals(s3));
    }
}
```

- true true
- false false
- true false
- false true



✓ What will be the output of the following Java program? \*

2/2

```
class Output
{
    public static void main(String args[])
    {
        int a = 1;
        int b = 2;
        int c = 3;
        a |= 4;
        b >>= 1;
        c <<= 1;
        a ^= c;
        System.out.println(a + " " + b + " " + c);
    }
}
```

- 3 1 6
- 2 2 3
- 2 3 4
- 3 3 6



✓ What will be the output of the following Java code? \*

2/2

```
class bool_operator
{
    public static void main(String args[])
    {
        boolean a = true;
        boolean b = !true;
        boolean c = a | b;
        boolean d = a & b;
        boolean e = d ? b : c;
        System.out.println(d + " " + e);
    }
}
```

- false false
- true ture
- true false
- false true



✓ Which collection class allows you to associate its elements with key values, and allows you to retrieve objects in FIFO (first-in, first-out) sequence? \*

2/2

- java.util.ArrayList
- java.util.LinkedHashMap
- java.util.HashMap
- java.util.TreeMap



✓ What will be the output of the following Java code?

2/2

```
class Output
{
    public static void main(String args[])
    {
        boolean a = true;
        boolean b = false;
        boolean c = a ^ b;
        System.out.println(!c);
    }
}
```

- 0
- 1
- false ✓
- true



✓ What will be the output of the following Java code? \*

2/2

```
class output
{
    public static void main(String args[])
    {
        String chars[] = {"a", "b", "c", "a", "c"};
        for (int i = 0; i < chars.length; ++i)
            for (int j = i + 1; j < chars.length; ++j)
                if(chars[i].compareTo(chars[j]) == 0)
                    System.out.print(chars[j]);
    }
}
```

- ab
- bc
- ca
- ac



✓ Which operator is used to invert all the digits in a binary representation of a number? \*



- ~
- <<<
- >>>
- ^



✓ What is the location of a parent node for any arbitrary node  $i$ ? \*

2/2

- $(i/2)$  position
- $(i+1)/$  position
- floor( $i/2$ ) position
- ceil( $i/2$ ) position



✓ A normal queue, if implemented using an array of size MAX\_SIZE, gets full when? \*

2/2

- Rear = MAX\_SIZE - 1
- Front = (rear + 1)mod MAX\_SIZE
- Front = rear + 1
- Rear = front



✗ What is the functionality of the following code? \*

0/2

```
public void function(Node node)
{
    if(size == 0)
        head = node;
    else
    {
        Node temp,cur;
        for(cur = head; (temp = cur.getNext())!=null; cur = temp);
        cur.setNext(node);
    }
    size++;
}
```

- inserting a node at the end of the list
- Deleting a node at the beginning of the list
- Inserting a node at the beginning of the list
- Deleting a node at the end of the list

✗

Correct answer

- inserting a node at the end of the list

✓ Which of these statements are incorrect? \*

2/2

- The left shift operator, <<, shifts all of the bits in a value to the left specified number of times
- The right shift operator, >>, shifts all of the bits in a value to the right specified number of times
- The left shift operator can be used as an alternative to multiplying by 2
- The right shift operator automatically fills the higher order bits with 0

✓

✓ What will be the output of the following Java program? \*

2/2

```
class leftshift_operator
{
    public static void main(String args[])
    {
        byte x = 64;
        int i;
        byte y;
        i = x << 2;
        y = (byte) (x << 2)
        System.out.print(i + " " + y);
    }
}
```

- 0 64
- 64 0
- 0 256
- 256 0



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