

Started on	Wednesday, 25 September 2024, 8:49 PM
State	Finished
Completed on	Wednesday, 25 September 2024, 9:09 PM
Time taken	20 mins 2 secs
Marks	8.00/10.00
Grade	80.00 out of 100.00

Question

1

Complete

Mark 1.00 out of 1.00

Consider the following Java code:

java

Copy code

```
import java.util.Stack;

public class Main {
    public static void main(String[] args) {
        Stack<Integer> stack = new Stack<>();
        stack.push(1);
        stack.push(2);
        stack.push(3);

        for (int i : stack) {
            if (i == 2) {
                stack.pop(); // Line A
            }
        }

        System.out.println(stack);
    }
}
```

What will happen when the program reaches Line A?

Select one or more:

- ☐ a. The program will remove the top of the stack (3), and print [1, 2].
- ☐ b. A `NullPointerException` will be thrown.
- ☐ c. The stack will correctly remove the element 2 and print [1, 3].
- ☒ d. A `ConcurrentModificationException` will be thrown.

Question

2

Complete

Mark 1.00 out of 1.00

Consider the following Java code using a stack in a multi-threaded environment:

```
import java.util.Stack;

class Worker extends Thread {

    private Stack<Integer> stack;

    Worker(Stack<Integer> stack) {
        this.stack = stack;
    }

    public void run() {
        for (int i = 0; i < 5; i++) {
            stack.push(i);
            System.out.println(Thread.currentThread().getName() + " pushed: " + i);
        }
    }
}

public class Main {

    public static void main(String[] args) throws InterruptedException {
        Stack<Integer> stack = new Stack<>();

        Worker worker1 = new Worker(stack);
        Worker worker2 = new Worker(stack);

        worker1.start();
        worker2.start();

        worker1.join();
        worker2.join();

        System.out.println("Final stack: " + stack);
    }
}
```

What is a possible output of the above program?

Question 3

Complete

Mark 1.00 out of
1.00

Select one or more:

- ☐ a. A `ConcurrentModificationException` will be thrown.
- ☐ b. The program will throw a `NullPointerException`.
- ☐ c. The program will deadlock.
- ☒ d. The final stack will contain the numbers 0 through 4 added by both threads, in no particular order.

Which of the following compile? (Choose all that apply)

Select one or more:

- ☒ a. `public void moreA(int... nums) {}`
- ☒ b. `public void moreB(String values, int... nums) {}`
- ☐ c. `public void moreF(String... values, int[] nums) {}`
- ☐ d. `public void moreC(int... nums, String values) {}`
- ☐ e. `public void moreE(String[] values, ...int nums) {}`
- ☐ f. `public void moreD(String... values, int... nums) {}`
- ☒ g. `public void moreG(String[] values, int[] nums) {}`

Question 4

Complete

Mark 1.00 out of
1.00

What is the result of the following code?

```
7: StringBuilder sb = new StringBuilder();  
8: sb.append("aaa").insert(1, "bb").insert(4, "ccc");  
9: System.out.println(sb);
```

Select one or more:

- ☐ a. `abbaaccc`
- ☐ b. The code does not compile
- ☒ c. `abbaccca`
- ☐ d. An exception is thrown.
- ☐ e. `bbaaccca`
- ☐ f. `bbaaaccc`

Question

5

Complete

Mark 1.00 out of 1.00

Consider the following code that calculates the factorial of a number using recursion:

```
public class Factorial {  
    public static int factorial(int n) {  
        if (n == 0 || n == 1) {  
            return 1;  
        } else {  
            return n * factorial(n - 1);  
        }  
    }  
}  
  
public static void main(String[] args) {  
    System.out.println(factorial(5));  
}  
}
```

If the recursive call depth equals the stack depth, how many stack frames will be used to calculate factorial(5)?

Select one or more:

- ☐ a. 4
- ☒ b. 6
- ☐ c. 5
- ☐ d. 10

Question

6

Complete

Mark 0.00 out of 1.00

What change would allow the following code snippet to compile? (Choose all that apply)

3: long x = 10;

4: int y = 2 * x;

Select one or more:

- ☐ a. No change; it compiles as is
- ☒ b. Change the data type of y on line 4 to long.
- ☒ c. Change the data type of y on line 4 to short.
- ☒ d. Cast x on line 4 to int.
- ☐ e. Change the data type of x on line 3 to short.
- ☒ f. Cast 2 * x on line 4 to int.

Question

7

Complete

Mark 1.00 out of 1.00

Choose the correct statement about the following code:

```
1: interface HasExoskeleton {  
2: abstract int getNumberOfSections();  
3: }  
4: abstract class Insect implements HasExoskeleton {  
5: abstract int getNumberOfLegs();  
6: }  
7: public class Beetle extends Insect {  
8: int getNumberOfLegs() { return 6; }  
9: }
```

Select one or more:

- ☐ a. It compiles but throws an exception at runtime.
- ☐ b. It compiles and runs without issue.
- ☐ c. The code will not compile because of line 4.
- ☒ d. The code will not compile because of line 7.
- ☐ e. The code will not compile because of line 2.

Question

8

Complete

Mark 1.00 out of 1.00

Given the following class, which of the following calls print out Blue Jay? (Choose all that apply)

```
public class BirdDisplay {  
    public static void main(String[] name) {  
        System.out.println(name[1]);  
    }  
}
```

Select one or more:

- ☐ a. java BirdDisplay.class Sparrow "Blue Jay"
- ☐ b. java BirdDisplay "Blue Jay" Sparrow
- ☐ c. java BirdDisplay Blue Jay Sparrow
- ☐ d. java BirdDisplay Sparrow Blue Jay
- ☐ e. Does not compile
- ☐ f. java BirdDisplay.class "Blue Jay" Sparrow
- ☒ g. java BirdDisplay Sparrow "Blue Jay"

Question

9

Complete

Mark 1.00 out of 1.00

Which of the following statements best distinguishes between supervised learning and unsupervised learning?

Select one or more:

- ☐ a. In supervised learning, the algorithm groups data into clusters, while in unsupervised learning, the algorithm makes predictions based on labeled data.
- ☐ b. Unsupervised learning can only work with numerical data, while supervised learning can handle both numerical and categorical data.
- ☒ c. Supervised learning requires labeled data, whereas unsupervised learning does not.
- ☐ d. Supervised learning is typically used for anomaly detection, whereas unsupervised learning is used for classification tasks.

Question

10

Complete

Mark 0.00 out of 1.00

What will be the output of the above code when the infix expression " $a+b*(c^d-e)^{(f+g*h)-i}$ " is converted to postfix?

Select one or more:

- ☐ a. $ab+cd^e-fgh^{*+^i}-$
- ☐ b. $abc^de-fgh^{*+^*+i}-$
- ☒ c. $abcd^e-fgh+^{*+i}-$
- ☐ d. $abcd^e-fgh^{*+^*+i}-$