

Rajalakshmi Engineering College

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 10

Section 1 : MCQ

1. What is the output of the following program?

```
class Arithmetic {  
    public static void main(String[] args) {  
        char ch = 'A';  
        System.out.println(ch);  
    }  
}
```

Answer

A

Status : Correct

Marks : 1/1

2. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int a = 5;  
        int b = 10;  
  
        int sum = a + b;  
        int bitwiseAnd = a & b;  
        int bitwiseOr = a | b;  
  
        System.out.println(sum);  
        System.out.println(bitwiseAnd);  
        System.out.println(bitwiseOr);  
    }  
}
```

Answer

10015

Status : Wrong

Marks : 0/1

3. What will be the output of the following code snippet?

```
import java.util.*;  
  
class OperatorPrecedenceExample {  
    public static void main(String[] args) {  
        int a = 5, b = 3, c = 2;  
        int result = a + b * c;  
  
        System.out.println(result);  
    }  
}
```

Answer

11

Status : Correct

Marks : 1/1

4. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int x = 5;  
        int X = 10;  
  
        int sum = x + X;  
        int bitwiseResult = x | X;  
  
        System.out.println(sum);  
        System.out.println(bitwiseResult);  
    }  
}
```

Answer

10 15

Status : Wrong

Marks : 0/1

5. Which of the following data types is used to store single characters?

Answer

char

Status : Correct

Marks : 1/1

6. What is the result of the following expression?

```
import java.util.*;  
  
class ComplexExpressionExample {  
    public static void main(String[] args) {  
        int a = 5, b = 2, c = 3, d = 4;  
        int result = a + b * c / d - b;  
  
        System.out.println(result);  
    }  
}
```

}

Answer

4

Status : Correct

Marks : 1/1

7. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int a = 10;  
        int b = 3;  
        System.out.println(a / b);  
    }  
}
```

Answer

3

Status : Correct

Marks : 1/1

8. What will be the output of the following code snippet?

```
class DivisionExample {  
    public static void main(String[] args) {  
        double num1 = 10.5;  
        double num2 = 3;  
        int result = (int)(num1 / num2);  
        System.out.println(result);  
    }  
}
```

Answer

3.5

Status : Wrong

Marks : 0/1

9. Which of the following is not a primitive data type?

Answer

string

Status : Correct

Marks : 1/1

10. What is the output of the following code?

```
import java.util.*;

class RelationalOperatorExample {
    public static void main(String[] args) {
        int x = 8, y = 4;
        boolean result = (x != y);

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

Answer

true

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
import java.util.*;

class TernaryOperatorExample {
    public static void main(String[] args) {
        int a = 5, b = 10;
        int result = (a > b) ? a : b;
        System.out.println(result);
    }
}
```

Answer

Compilation error

Status : Wrong

Marks : 0/1

12. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int count = 8;  
        count = count ^ 1;  
  
        System.out.println(count);  
    }  
}
```

Answer

Compilation error

Status : Wrong

Marks : 0/1

13. What will be the output of the following program?

```
class DataTypesMCQ {  
    public static void main(String[] args) {  
        int a = 10;  
        double b = 5;  
        System.out.println(a / b);  
    }  
}
```

Answer

2.0

Status : Correct

Marks : 1/1

14. Which of the following data types is used to store floating-point numbers with greater precision?

Answer

double

Status : Correct

Marks : 1/1

15. What is the output of the following program?

```
class Demo {  
    public static void main(String[] args) {  
        String text = "Hello, World!";  
        System.out.println(text);  
    }  
}
```

Answer

Hello, World!

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Gloria is responsible for monitoring the performance of two machines in a factory. She needs to determine which of the two machines is operating closest to the optimal temperature of 100 degrees Celsius using the relational operator.

Assist Gloria in displaying the machine's temperature, which is closer to 100, and the difference from 100.

Input Format

The first line of input consists of an integer N, representing the temperature of the first machine.

The second line consists of an integer M, representing the temperature of the second machine.

Output Format

The output prints "The integer closer to 100 is X with a difference of Y" where X is the temperature of the closer machine and Y is the difference from 100.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 90

80

Output: The integer closer to 100 is 90 with a difference of 10

Answer

```
import java.util.Scanner;
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);
```

```
  
        int N = sc.nextInt();  
        int M = sc.nextInt();
```

```
  
        int diffN = Math.abs(N - 100);  
        int diffM = Math.abs(M - 100);
```

```
  
        if (diffN < diffM) {  
            System.out.println("The integer closer to 100 is " + N + " with a difference  
of " + diffN);  
        } else {  
            System.out.println("The integer closer to 100 is " + M + " with a difference  
of " + diffM);  
        }  
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. PROBLEM STATEMENT:

Dave got two students who wants help with their doubt. Each handouts an integer and wants to find if one Integer Positive While the Other is Not Divisible by 3. Write a program to achieve this and conclude for them.

Input Format

The first line of input represents the first integer.

The second line of input represents the second integer.

Output Format

The output should display as "One of the integers is positive while the other is not divisible by 3." or "Neither of the integers meets the condition."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

3

Output: One of the integers is positive while the other is not divisible by 3.

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);

        int a = sc.nextInt();
        int b = sc.nextInt();

        if ((a > 0 && b % 3 != 0) || (b > 0 && a % 3 != 0)) {
            System.out.println("One of the integers is positive while the other is not
divisible by 3.");
        } else {
            System.out.println("Neither of the integers meets the condition.");
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem statement

Manoj, a developer at MoneyMatters Inc., is working on improving the company's financial system. He needs to create a program that takes an integer input, converts it into a double, and displays both the original integer and the converted double value.

Input Format

The input consists of a single integer representing a monetary amount.

Output Format

The first line of the output displays the "Original Integer: ", followed by an integer representation of the input value.

The second line displays the "Converted Double: ", followed by a double value representing the input as a decimal value.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 20

Output: Original Integer: 20

Converted Double: 20.0

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int number = sc.nextInt();
        double converted = (double) number;
        System.out.println("Original Integer: " + number);
        System.out.println("Converted Double: " + converted);
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Vishal and Arun are discussing the properties of numbers. Vishal gives Arun two integers. He asks Arun to check if the sum of these two numbers is a multiple of their product.

Can you assist Arun and determine whether the sum is a multiple of the product?

Input Format

The input consists of two space-separated integers.

Output Format

The output prints:

1. "Sum is Multiple of Product" if the sum of the two numbers is divisible by their product.
2. "Sum is Not Multiple of Product" otherwise.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1 2

Output: Sum is Not Multiple of Product

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        int sum = a + b;
        int product = a * b;

        if (sum % product == 0) {
            System.out.println("Sum is Multiple of Product");
        } else {
            System.out.println("Sum is Not Multiple of Product");
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement:

Emily has a beautiful circular garden in her backyard. She's interested in calculating two important measurements for her garden: the circumference and the area. To do this, she needs a program that can take the radius of her circular garden as input and provide the calculated circumference and area as output. The formulas she should use are as follows:

To calculate the circumference (C) of a circle, you can use the formula:

$$C = 2 * \pi * r$$

$$A = \pi * r^2$$

Where:

C represents the circumference.

A represents the area.

π (pi) is approximately 3.14159.

r is the radius of the circle.

Emily is not a programmer, and she needs your help to create a program that will make these calculations for her garden.

Input Format

The first line of input contains a single double-point number radius, representing the radius of the circle.

Output Format

The output should consist of two lines:

The first line should print the circumference of the circle rounded to 2 decimal places, followed by the unit "meters".

The second line should print the area of the circle rounded to 2 decimal places, followed by the unit "square meters".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3.0

Output: Circumference: 18.85 meters

Area: 28.27 square meters

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        double r = sc.nextDouble();
        double pi = 3.14159;
```

```
double circumference = 2 * pi * r;  
double area = pi * r * r;  
  
    System.out.printf("Circumference: %.2f meters Area: %.2f square meters",  
circumference, area);  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q6

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Joey is learning about bitwise operations and is working on a project that involves extracting specific bits from integers. He needs to write a program that takes an integer and the number of bits N as input and outputs the value of the lowest N bits of the integer.

Help Joey in his project to understand and visualize how bitwise operations work in practical scenarios.

Input Format

The first line of input consists of an integer X, representing the given integer.

The second line consists of an integer N, representing the number of bits to extract.

Output Format

The output displays "Result: " followed by an integer representing the value of the lowest N bits of the given integer.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 85

2

Output: Result: 1

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int X = sc.nextInt();
        int N = sc.nextInt();

        int result = X & ((1 << N) - 1);

        System.out.println("Result: " + result);
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q7

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement:

Miles is working on a program that involves analyzing two integers. He wants to check if either one of the integers is both:

Less than or equal to zero, andOdd.Can you help him create a program that identifies whether either of the integers meets these conditions?

Input Format

The input consists of two integers on separate lines, denoted as 'input1' and 'input2'.

Output Format

A single line with a boolean result (either 'true' or 'false') indicating whether either 'input1' or 'input2' is both less than or equal to zero and odd.

Refer to the sample output for format specifications

Sample Test Case

Input: -45

10

Output: true

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int input1 = sc.nextInt();
        int input2 = sc.nextInt();

        boolean result = (input1 <= 0 && input1 % 2 != 0) || (input2 <= 0 && input2 %
2 != 0);

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

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q8

Attempt : 1
Total Mark : 10
Marks Obtained : 5

Section 1 : Coding

1. Problem Statement

In the Kingdom of Finance, the royal treasury is managed by the treasurer, Sir Cedric. Sir Cedric tracks the daily expenses of the kingdom using an expense report that lists three major categories: food, clothing, and utilities. However, the King wants to know if the average daily expense is greater than at least two of these categories to ensure the kingdom is spending wisely.

Your task is to help Sir Cedric determine if the average daily expense is greater than two of the categories. Specifically, you need to calculate the average of the three expenses and check if it is greater than any two categories.

Note: Use the ternary operator

Input Format

Three integers a, b, and c represent the daily expenses for food, clothing, and utilities. Each integer is provided on a single line.

Output Format

The average of the three expenses, rounded to two decimal places.

A message indicating whether the average is greater than at least two of the expense categories.

1. If the average is greater than the two smallest monthly expenses, print "Average is greater than both X and Y," where X and Y are the two smallest expenses.
2. Otherwise, display "Average is not greater than two smallest expenses".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4

6

10

Output: 6.67

Average is greater than both 4 and 6

Answer

```
import java.util.Scanner;  
import java.util.Arrays;
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        int a = sc.nextInt();  
        int b = sc.nextInt();  
        int c = sc.nextInt();  
  
        double avg = (a + b + c) / 3.0;  
  
        int[] arr = {a, b, c};
```



```
Arrays.sort(arr);
int x = arr[0], y = arr[1]; // two smallest

String message = (avg > x && avg > y)
    ? String.format("%.2f \nAverage is greater than both %d and %d", avg, x, y)
    : String.format("%.2f \nAverage is not greater than two smallest
expenses", avg);

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

Status : Partially correct

Marks : 5/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q9

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Phill is a quality control manager at a manufacturing plant. He needs to verify if a sensor reading at a midpoint station (S2) falls exactly halfway between the readings of the previous station (S1) and the next station (S3). Help him by developing a program that checks if the second sensor reading is the average (midpoint) of the first and third sensor readings.

Use the relational operator to solve the program.

Input Format

The first line of input consists of an integer S1, representing the sensor reading of the first station.

The second line consists of an integer S2, representing the sensor reading of the midpoint station.

The third line consists of an integer S3, representing the sensor reading of the next station.

Output Format

The first line of output displays a boolean value representing whether the sensor reading at the midpoint station is halfway between the readings of the first and the next stations.

The second line displays one of the following:

1. If the result is true, print "The second integer is halfway between the first and third integers."
2. Otherwise, print "The second integer is not halfway between the first and third integers."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

7

10

Output: false

The second integer is not halfway between the first and third integers.

Answer

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int S1 = sc.nextInt();
        int S2 = sc.nextInt();
        int S3 = sc.nextInt();

        boolean result = (2 * S2 == S1 + S3);

        System.out.println(result);
        if (result) {
```

```
        System.out.println("The second integer is halfway between the first and  
third integers.");  
    } else {  
        System.out.println("The second integer is not halfway between the first  
and third integers.");  
    }  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q10

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Aishu is supervising a construction project that needs to be completed with the help of three workers: A, B, and C.

She knows how many days each of them would take to complete the entire project individually:

A can complete it in x days, B in y days, C in z days.

Initially, all three workers (A, B, and C) work together for d1 days.

After that, C leaves, and only A and B continue for another d2 days.

Then B also leaves, and A works alone to finish the remaining work.

Your task is to help aishu to implement this functionality using the class WorkDistribution and Method calculateWork(int x, int y, int z, int d1, int d2)

Calculate the total work completed in the first d_1 days by A, B, and C. Calculate the work completed in the next d_2 days by A and B. Determine the remaining work after these $d_1 + d_2$ days.

Input Format

The first line of input contains five space-separated integers: x y z d_1 d_2

where:

x represents the Days A takes to complete the work alone

y represents the Days B takes to complete the work alone

z represents the Days C takes to complete the work alone

d_1 represents the Days A, B, and C work together

d_2 represents the Days A and B work together (after C leaves)

Output Format

The first line of output prints "Work done in first d_1 days (A+B+C): " followed by a double value rounded to 2 decimal places.

The second line of output prints "Work done in next d_2 days (A+B): " followed by a double value rounded to 2 decimal places.

The third line prints "Remaining work: " followed by a double value rounded to 2 decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10 20 30 2 2

Output: Work done in first d_1 days (A+B+C): 0.37

Work done in next d_2 days (A+B): 0.30

Remaining work: 0.33

Answer

```

import java.util.Scanner;

class WorkDistribution {
    public void calculateWork(int x, int y, int z, int d1, int d2) {
        double rateA = 1.0 / x;
        double rateB = 1.0 / y;
        double rateC = 1.0 / z;

        double work1 = d1 * (rateA + rateB + rateC);
        double work2 = d2 * (rateA + rateB);
        double remaining = 1 - (work1 + work2);

        System.out.printf("Work done in first d1 days (A+B+C): %.2f ", work1);
        System.out.printf("Work done in next d2 days (A+B): %.2f ", work2);
        System.out.printf("Remaining work: %.2f", remaining);
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int x = sc.nextInt();
        int y = sc.nextInt();
        int z = sc.nextInt();
        int d1 = sc.nextInt();
        int d2 = sc.nextInt();

        WorkDistribution wd = new WorkDistribution();
        wd.calculateWork(x, y, z, d1, d2);
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_Week 12_Java_Lamba Expressions_MCQ

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : MCQ

1. What is a lambda expression in Java?

Answer

A way to define anonymous methods

Status : Correct

Marks : 1/1

2. Can a lambda expression in Java have a body with multiple statements?

Answer

Yes, if the statements are enclosed in curly braces

Status : Correct

Marks : 1/1

3. What is the syntax for a basic lambda expression in Java?

Answer

(parameters) -> expression

Status : Correct

Marks : 1/1

4. Which of the following is a valid lambda expression in Java?

Answer

All of the mentioned options

Status : Correct

Marks : 1/1

5. Can a lambda expression in Java have a body with multiple statements?

Answer

Yes, if the statements are enclosed in curly braces

Status : Correct

Marks : 1/1

6. Can a lambda expression have more than one parameter?

Answer

Yes, it can have multiple parameters

Status : Correct

Marks : 1/1

7. What is the return type of a lambda expression in Java?

Answer

The return type is inferred from the context

Status : Correct

Marks : 1/1

8. Which of the following interfaces is NOT a functional interface in Java?

Answer

Iterable

Status : Correct

Marks : 1/1

9. Which functional interface is commonly used with lambda expressions in Java?

Answer

Runnable

Status : Correct

Marks : 1/1

10. Which functional interface in Java takes two arguments and returns a result?

Answer

BiFunction

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Alex is learning about Java's functional interfaces and lambda expressions.

He wants to write a simple program that prints the square of each number in an array using a predefined functional interface.

Help Alex complete this task using the Consumer functional interface.

Input Format

- The first line contains an integer N, the number of elements in the array.
- The second line contains N space-separated integers.

Output Format

- Print the squares of all elements in the array, separated by a space.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4

1 2 3 4

Output: 1 4 9 16

Answer

```
import java.util.*;
import java.util.function.Consumer;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Read number of elements
        int n = sc.nextInt();
        int[] arr = new int[n];

        // Read array elements
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }

        // Define a Consumer functional interface using lambda expression
        Consumer<Integer> printSquare = x -> System.out.print((x * x) + " ");

        // Apply the lambda for each element
        for (int num : arr) {
            printSquare.accept(num);
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Abi is working on a text analysis project where she needs to categorize words based on their length.

Words that have three or fewer characters are considered "Short", while words with more than three characters are classified as "Long."

Write a Java program that takes a sentence as input, analyzes each word, and prints a list showing whether each word is "Short" or "Long."

Use the predefined functional interface `Function<String, String>` along with a lambda expression for categorization.

Input Format

A single line containing a sentence (words separated by spaces).

Output Format

- A single line with each word categorized as "Short" or "Long", separated by spaces.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: I love my cat

Output: Short Long Short Short

Answer

```
import java.util.*;
import java.util.function.Function;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Read input sentence
        String sentence = sc.nextLine();

        // Split sentence into words
        String[] words = sentence.split(" ");

        // Define Function interface using lambda
        Function<String, String> categorize = word ->
            (word.length() <= 3) ? "Short" : "Long";

        // Analyze and print results
        for (String word : words) {
            System.out.print(categorize.apply(word) + " ");
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Sabrina is working on a project that involves analyzing a set of numbers. In her exploration, she encounters scenarios where extracting even numbers and finding their sum is essential.

Create a program that calculates the sum of even numbers from a given array of integers using a lambda expression.

Input Format

The first line of input consists of an integer N, representing the size of the array.

The second line consists of N space-separated integers, representing the elements of the array.

Output Format

The output prints the sum of the even integers from the array.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3

29 37 45

Output: 0

Answer

```
import java.util.Scanner;
class EvenSumCalculator {
    public static int calculateEvenSum(int[] numbers) {
        return java.util.Arrays.stream(numbers)
            .filter(n -> n % 2 == 0)
            .sum();
    }
}
class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        int count = scanner.nextInt();
        int[] numbers = new int[count];

        for (int i = 0; i < count; i++) {
            numbers[i] = scanner.nextInt();
        }
        int sum = EvenSumCalculator.calculateEvenSum(numbers);
        System.out.println(sum);

        scanner.close();
    }
}
```

Status: Correct

Marks: 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 10_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 14

Section 1 : MCQ

1. What will happen if you add elements in descending order in a TreeSet?

Answer

They are sorted in ascending order

Status : Correct

Marks : 1/1

2. Which method retrieves the lowest key in a TreeMap?

Answer

firstKey()

Status : Correct

Marks : 1/1

3. What is the time complexity of retrieving an element from a HashSet?

Answer

$O(1)$

Status : Correct

Marks : 1/1

4. Which of the following is true about HashMap?

Answer

It is not synchronized

Status : Correct

Marks : 1/1

5. What happens when you add duplicate elements to a HashSet?

Answer

The duplicate is ignored

Status : Correct

Marks : 1/1

6. What happens if two keys have the same hash code in a HashMap?

Answer

A linked list is used to store values with the same hash

Status : Correct

Marks : 1/1

7. Which method removes all elements from a Set?

Answer

clear()

Status : Correct

Marks : 1/1

8. Which of the following is true about TreeMap?

Answer

It maintains natural ordering

Status : Correct

Marks : 1/1

9. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, String> map = new HashMap<>();
        map.put("A", "Apple");
        map.put("B", "Banana");
        map.put("C", "Cherry");
        map.replace("B", "Blueberry");
        System.out.println(map);
    }
}
```

Answer

{A=Apple, B=Blueberry, C=Cherry}

Status : Correct

Marks : 1/1

10. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("A", 1);
        map.put("B", 2);
        map.put("C", 3);
        System.out.println(map.containsKey("B"));
    }
}
```

Answer

true

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("X", 10);
        map.put("Y", 20);
        map.put("Z", 30);
        map.remove("Y");
        System.out.println(map);
    }
}
```

Answer

{X=10, Z=30}

Status : Correct

Marks : 1/1

12. Which statement is true about HashSet and TreeSet?

Answer

TreeSet allows duplicate elements

Status : Wrong

Marks : 0/1

13. What will happen if you add a null element to a TreeSet?

Answer

An exception occurs

Status : Correct

Marks : 1/1

14. How does HashSet check for duplicate elements?

Answer

Using equals() and hashCode()

Status : Correct

Marks : 1/1

15. Which of the following allows null keys in Java?

Answer

HashMap

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

In a ticket reservation system, you store the available seat numbers in a TreeSet. Users input their desired seat number, and the program checks whether the chosen seat is available.

Using a TreeSet ensures quick and efficient verification of seat availability, ensuring a smooth and organized ticket booking process.

Input Format

The first line of input contains a single integer n , representing the number of available seats.

The second line contains n space-separated integers, representing the available seat numbers.

The third line contains an integer *m*, representing the seat number that needs to be searched.

Output Format

The output displays "[*m*] is present!" if the given seat is available. Otherwise, it displays "[*m*] is not present!"

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

2 4 5 6

5

Output: 5 is present!

Answer

```
import java.util.Set;
import java.util.TreeSet;
import java.util.Scanner;
class NumberChecker {
    private Set<Integer> numberSet;

    public NumberChecker(Set<Integer> numberSet) {
        this.numberSet = numberSet;
    }

    public void addNumbers(int[] numbers) {
        for (int number : numbers) {
            numberSet.add(number);
        }
    }

    public String checkNumber(int number) {
        return numberSet.contains(number) ? number + " is present!" : number + " is not present!";
    }
}
class Main {
    public static void main(String[] args) {
```

```
Scanner scanner = new Scanner(System.in);
int numberOfElements = scanner.nextInt();
int[] numbers = new int[numberOfElements];

for (int i = 0; i < numberOfElements; i++) {
    numbers[i] = scanner.nextInt();
}

int elementToCheck = scanner.nextInt();
scanner.close();

Set<Integer> numberSet = new TreeSet<>();
NumberChecker numberChecker = new NumberChecker(numberSet);
numberChecker.addNumbers(numbers);

System.out.println(numberChecker.checkNumber(elementToCheck));
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In the mystical realm of programming, there exists a magical incantation to reveal hidden words.

Elara, the skilled enchantress, wishes to summon a word using her spell and then reverse its characters to uncover its enchanted reflection.

Write a program that uses the predefined functional interface `Supplier<String>` and a lambda expression to:

Supply (generate) a string, and

Display its reversed form.

Input Format

No input is required from the user.

The string must be supplied internally using a Supplier<String>.

Output Format

Print the reversed version of the supplied string.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Wizard!!

Output: !!draziW

Answer

```
import java.util.Scanner;

public class Main {

    // Interface for the Lambda Expression
    interface ReverseStringFunction {
        String reverse(String input);
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        String input = scanner.nextLine();

        // Use Lambda Expression to reverse the string
        String reversed = ((ReverseStringFunction) s -> new
        StringBuilder(s).reverse().toString()).reverse(input);

        System.out.println(reversed);

        scanner.close();
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

John is organizing a fruit festival, and the quantities of various fruits are stored in a HashMap where fruit names are keys and quantities are values.

Help him develop a program to find the total quantity of fruits for the festival by summing up the values in the HashMap.

Input Format

The input consists of fruit quantities in the format 'fruitName:quantity', where fruitName is the name of the fruit(a string), and quantity is a double value representing the quantity.

The input is terminated by entering "done".

Output Format

The output prints a double value, representing the sum of values in the HashMap, rounded off to two decimal places.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are entered, print "Invalid format".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Banana:15.2

Orange:56.3

Mango:47.3

done

Output: 118.80

Answer

```
import java.util.Scanner;
import java.util.Map;
import java.util.HashMap;
class ValueProcessor {
    public static Map<String, Double> readValues(Scanner scanner) {
        Map<String, Double> valueMap = new HashMap<>();
        while (true) {
            String input = scanner.nextLine();
            if (input.toLowerCase().equals("done")) {
                break;
            }
            String[] pair = input.split(":");
            if (pair.length == 2) {
                String key = pair[0].trim();
                try {
                    double value = Double.parseDouble(pair[1].trim());
                    valueMap.put(key, value);
                } catch (NumberFormatException e) {
                    System.out.println("Invalid input");
                    return null;
                }
            } else {
```

```

        System.out.println("Invalid format");
        return null;
    }
}
return valueMap;
}

public static double calculateSum(Map<String, Double> valueMap) {
    double sum = 0;
    for (double value : valueMap.values()) {
        sum += value;
    }
    return sum;
}

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Map<String, Double> valueMap = ValueProcessor.readValues(scanner);
        if (valueMap != null) {
            double sum = ValueProcessor.calculateSum(valueMap);
            System.out.printf("%.2f\n", sum);
        }
        scanner.close();
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 11

Attempt : 1
Total Mark : 20
Marks Obtained : 10

Section 1 : Project

1. Problem Statement

In ABC Corporation, employee records are stored in a database.

To efficiently manage employee details using Java and JDBC, you are tasked with building an Employee Management System that supports the following functionalities:

Adding a new employee

Updating an employee's salary

Viewing an employee's details

Displaying all employees

You are given two files:

File 1: Employee.java (POJO Class)

This class represents the Employee entity.

An Employee contains the following details:

Field Description

employeeId Unique Employee ID (Integer)

name Employee Name (String)

department Employee Department (String)

salary Employee Salary (Double)

Students must write code in the marked area:

```
class Employee {  
    private int employeeId;  
    private String name;  
    private String department;  
    private double salary;  
  
    public Employee() {}  
  
    public Employee(int employeeId, String name, String department, double  
salary) {  
        // write your code here  
    }  
  
    // Include getters and setters  
}
```

Expected in this part:

Assign parameter values to instance variables inside the constructor.

Add getters and setters for all attributes.

File 2: EmployeeDAO.java (Data Access Layer)

This class handles all database operations using JDBC.

Students must complete the missing JDBC logic in the following methods:

```
class EmployeeDAO {

    public void addEmployee(Connection conn, Employee employee) throws
SQLException {
        // write your code here
    }

    public void updateSalary(Connection conn, int employeeId, double
newSalary) throws SQLException {
        // write your code here
    }

    public void deleteEmployee(Connection conn, int employeeId) throws
SQLException {
        // write your code here
    }

    public Employee viewEmployeeRecord(Connection conn, int employeeId)
throws SQLException {
        // write your code here
    }

    public List<Employee> displayAllEmployees(Connection conn) throws
SQLException {
        // write your code here
    }
}
```



```
private Employee mapToEmployee(ResultSet rs) throws SQLException {  
    return new Employee(  
        // write your code here  
    );  
}  
}
```

Expected in this part:

Write SQL queries for INSERT, UPDATE, DELETE, SELECT.

Execute queries using PreparedStatement or Statement.

Map ResultSet rows to Employee objects using mapToEmployee().

Return a List<Employee> where required.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri_dbUsername: testPassword: test123

The employees table has already been created with the following structure:

Input Format

The first line of input consists of an integer choice, representing the operation to be performed:

(1 for Add Employee, 2 for Update Salary, 3 for View Employee Record, 4 for Display All Employees, 5 for Exit)

For choice 1 (Add Employee):

1. The second line consists of an integer employee_id.
2. The third line consists of a string name.
3. The fourth line consists of a string department.
4. The fifth line consists of a double salary (must be at least 30000).

For choice 2 (Update Salary):

1. The second line consists of an integer `employee_id`.
2. The third line consists of a double `new_salary` (must be at least 30000).

For choice 3 (View Employee Record):

1. The second line consists of an integer `employee_id`.

For choice 4 (Display All Employees).

For choice 5 (Exit).

Output Format

For choice 1 (Add Employee),

1. Print "Employee added successfully" if the employee was added.

For choice 2 (Update Salary),

1. Print "Salary updated successfully" if the salary update was successful.
2. Print "Employee not found." if the specified employee ID does not exist.
3. Print "Salary must be at least 30000." if the provided salary is below the minimum.

For choice 3 (View Employee Record),

1. Display the employee details in the format:
2. ID: `[employee_id]` | Name: `[name]` | Department: `[department]` | Salary: `[salary]`
3. Print "Employee not found." if the specified employee ID does not exist.

For choice 4 (Display All Employees),

1. Display each employee on a new line in the format:
2. ID | Name | Department | Salary

For choice 5 (Exit),

1. Print "Exiting Employee Management System."

For invalid input:

1. Print "Invalid choice. Please try again."

Sample Test Case

Input: 1

101

Alice Johnson

Engineering

31000.75

4

6

5

Output: Employee added successfully

ID | Name | Department | Salary

101 | Alice Johnson | Engineering | 31000.75

Invalid choice. Please try again.

Exiting Employee Management System.

Answer

```
import java.sql.*;
```

```
import java.util.Scanner;
```

```
class Employee {
```

```
    private int employeeId;
```

```
    private String name;
```

```
    private String department;
```

```
    private double salary;
```

```
// Constructor
public Employee(int employeeId, String name, String department, double
salary) {
    this.employeeId = employeeId;
    this.name = name;
    this.department = department;
    this.salary = salary;
}

// Getters and Setters
public int getEmployeeId() { return employeeId; }
public void setEmployeeId(int employeeId) { this.employeeId = employeeId; }

public String getName() { return name; }
public void setName(String name) { this.name = name; }

public String getDepartment() { return department; }
public void setDepartment(String department) { this.department =
department; }

public double getSalary() { return salary; }
public void setSalary(double salary) { this.salary = salary; }
}
```

```
class EmployeeManagementSystem {
```

```
    // Add Employee
```

```
    public static void addEmployee(Connection conn, Scanner scanner) {
        int employeeId = scanner.nextInt();
        scanner.nextLine(); // Consume newline
        String name = scanner.nextLine();
        String department = scanner.nextLine();
        double salary = scanner.nextDouble();
```

```
        if (salary < 30000) {
```

```
            System.out.println("Salary must be at least 30000.");
            return;
        }
```

```
        // Create an Employee POJO object
```

```
        Employee employee = new Employee(employeeId, name, department,
salary);
    }
```

```

String insertQuery = "INSERT INTO employees (employee_id, name,
department, salary) VALUES (?, ?, ?, ?)";
try (PreparedStatement stmt = conn.prepareStatement(insertQuery)) {
    stmt.setInt(1, employee.getEmployeeId());
    stmt.setString(2, employee.getName());
    stmt.setString(3, employee.getDepartment());
    stmt.setDouble(4, employee.getSalary());

    int rowsInserted = stmt.executeUpdate();
    System.out.println(rowsInserted > 0 ? "Employee added successfully" :
"Failed to add employee.");
} catch (SQLException e) {
    System.out.println("Error adding employee: " + e.getMessage());
}
}

```

// Update Salary

```

public static void updateSalary(Connection conn, Scanner scanner) {
    int employeeId = scanner.nextInt();
    double newSalary = scanner.nextDouble();

```

```

    if (newSalary < 30000) {
        System.out.println("Salary must be at least 30000.");
        return;
    }

```

```

String updateQuery = "UPDATE employees SET salary = ? WHERE
employee_id = ?";
try (PreparedStatement stmt = conn.prepareStatement(updateQuery)) {
    stmt.setDouble(1, newSalary);
    stmt.setInt(2, employeeId);

    int rowsUpdated = stmt.executeUpdate();
    System.out.println(rowsUpdated > 0 ? "Salary updated successfully" :
"Employee not found.");
} catch (SQLException e) {
    System.out.println("Error updating salary: " + e.getMessage());
}
}

```

// View Employee Record

```

public static void viewEmployeeRecord(Connection conn, Scanner scanner) {
    int employeeId = scanner.nextInt();
    String selectQuery = "SELECT * FROM employees WHERE employee_id = ?";

    try (PreparedStatement stmt = conn.prepareStatement(selectQuery)) {
        stmt.setInt(1, employeeId);
        ResultSet rs = stmt.executeQuery();

        if (rs.next()) {
            Employee employee = new Employee(
                rs.getInt("employee_id"),
                rs.getString("name"),
                rs.getString("department"),
                rs.getDouble("salary")
            );
            System.out.printf("ID: %d | Name: %s | Department: %s | Salary: %.2f%n",
                employee.getEmployeeId(),
                employee.getName(),
                employee.getDepartment(),
                employee.getSalary());
        } else {
            System.out.println("Employee not found.");
        }
    } catch (SQLException e) {
        System.out.println("Error retrieving employee record: " + e.getMessage());
    }
}

// Display All Employees
public static void displayAllEmployees(Connection conn) {
    String displayQuery = "SELECT * FROM employees";

```

```

    try (Statement stmt = conn.createStatement();
        ResultSet rs = stmt.executeQuery(displayQuery)) {

        System.out.println("ID | Name | Department | Salary");
        while (rs.next()) {
            Employee employee = new Employee(
                rs.getInt("employee_id"),
                rs.getString("name"),
                rs.getString("department"),
                rs.getDouble("salary")
            );

```

```

    );
    System.out.printf("%d | %s | %s | %.2f%n",
        employee.getEmployeeId(),
        employee.getName(),
        employee.getDepartment(),
        employee.getSalary());
    }
} catch (SQLException e) {
    System.out.println("Error displaying employees: " + e.getMessage());
}
}

public static void main(String[] args) {
    String url = "jdbc:mysql://localhost/ri_db";
    String username = "test";
    String password = "test123";

    try (Connection conn = DriverManager.getConnection(url, username,
password);
        Scanner scanner = new Scanner(System.in)) {

        int choice;
        do {
            choice = scanner.nextInt();

            switch (choice) {
                case 1 -> addEmployee(conn, scanner);
                case 2 -> updateSalary(conn, scanner);
                case 3 -> viewEmployeeRecord(conn, scanner);
                case 4 -> displayAllEmployees(conn);
                case 5 -> System.out.println("Exiting Employee Management
System.");
                default -> System.out.println("Invalid choice. Please try again.");
            }

        } while (choice != 5);

    } catch (SQLException e) {
        System.out.println("Database Error: " + e.getMessage());
    }
}
}

```

Status : Correct

Marks : 10/10

2. Problem Statement

Create a JDBC-based School Management System that handles runtime input to manage student records. The system should allow users to:

Add a new student (student ID, name, grade level, GPA).

Update a student's GPA, ensuring the GPA value is within the valid range (0.0 - 4.0).

View a specific student's record by student ID.

Display all students in the database.

Exit the application.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri_db

USER: test

PWD: test123

The students table has already been created with the following structure:

Table Name: students

Input Format

The first line of input consists of an integer choice, representing the operation to be performed:

(1 for Add Student, 2 for Update GPA, 3 for View Student Record, 4 for Display All Students, 5 for Exit)

For choice 1 (Add Student):

- The second line consists of an integer `student_id`.
- The third line consists of a string `name`.
- The fourth line consists of a string `grade_level`.
- The fifth line consists of a double `gpa` (must be between 0.0 and 4.0).

For choice 2 (Update GPA):

- The second line consists of an integer `student_id`.
- The third line consists of a double `new_gpa` (must be between 0.0 and 4.0).

For choice 3 (View Student Record):

- The second line consists of an integer `student_id`.

For choice 4 (Display All Students):

- No additional inputs are required.

For choice 5 (Exit):

- No additional inputs are required.

Output Format

The output displays:

For choice 1 (Add Student):

- Print "Student added successfully" if the student was added.
- Print "Failed to add student." if the insertion failed.

For choice 2 (Update GPA):

- Print "GPA updated successfully" if the GPA update was successful.
- Print "Student not found." if the specified student ID does not exist.
- Print "GPA must be between 0.0 and 4.0." if the provided GPA is out of the valid range.

For choice 3 (View Student Record):

- Display the student details in the format:
ID: [`student_id`] | Name: [`name`] | Grade Level: [`grade_level`] | GPA: [`gpa`]
- Print "Student not found." if the specified student ID does not exist.

For choice 4 (Display All Students):

- Display each student on a new line in the format:
- ID | Name | Grade Level | GPA
- If there are no records, print nothing (or handle with an appropriate message if desired).

For choice 5 (Exit):

- Print "Exiting School Management System."

For invalid input:

- Print "Invalid choice. Please try again."

Sample Test Case

Input: 1

101

Alice Johnson

10

3.8

5

Output: Student added successfully
Exiting School Management System.

Answer

Status : -

Marks : 0/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 9_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 12

Section 1 : MCQ

1. What will be the output of the following code?

```
import java.util.ArrayList;  
  
public class Main {  
    public static void main(String[] args) {  
        ArrayList<String> list = new ArrayList<>();  
        list.add("Apple");  
        list.add("Banana");  
        list.remove("Apple");  
        System.out.println(list);  
    }  
}
```

Answer

[Banana]

Status : Correct

Marks : 1/1

2. What does the addFirst() method of LinkedList do?

Answer

Adds an element to the beginning of the list

Status : Correct

Marks : 1/1

3. What will be the output of the following code?

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Stack<Integer> stack = new Stack<>();
        for (int i = 1; i <= 3; i++)
            stack.push(i * 2);
        stack.pop();
        stack.push(10);
        System.out.println(stack.peek());
    }
}
```

Answer

10

Status : Correct

Marks : 1/1

4. What is Collection in Java?

Answer

A group of objects

Status : Correct

Marks : 1/1

5. What is the correct way to create an ArrayList in Java?

Answer

```
ArrayList<String> list = new ArrayList<>();
```

Status : Correct

Marks : 1/1

6. Which method is used to add an element to the top of the stack?

Answer

```
push()
```

Status : Correct

Marks : 1/1

7. What will be the output of the following code?

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

Answer

```
[1, 2, 10, 4]
```

Status : Correct

Marks : 1/1

8. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
```

```
ArrayList<String> list = new ArrayList<>();  
list.add("Java");  
list.add("Python");  
list.add("Java");  
list.add("C++");  
System.out.println(list.indexOf("Java"));  
}  
}
```

Answer

0

Status : Correct

Marks : 1/1

9. What will be the output of the following code?

```
import java.util.*;  
public class Main {  
    public static void main(String[] args) {  
        Stack<Integer> s = new Stack<>();  
        s.push(10);  
        s.push(20);  
        s.push(30);  
        System.out.println(s.peek());  
    }  
}
```

Answer

10

Status : Wrong

Marks : 0/1

10. What will be the output of the following code?

```
import java.util.*;  
class Main {  
    public static void main(String[] args) {  
        ArrayList<Integer> list = new ArrayList<>();  
        list.add(1);  
    }  
}
```

```
list.add(2);  
list.add(3);  
list.add(4);  
list.add(5);  
System.out.println(list.get(3));  
}  
}
```

Answer

4

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
import java.util.ArrayList;  
  
public class Main {  
    public static void main(String[] args) {  
        ArrayList<Integer> list = new ArrayList<>();  
        list.add(10);  
        list.add(20);  
        list.add(30);  
        System.out.println("Size of the list: " + list.size());  
    }  
}
```

Answer

Size of the list: 3

Status : Correct

Marks : 1/1

12. Which of the following methods removes and returns the last element from a LinkedList?

Answer

pop()

Status : Wrong

Marks : 0/1

13. How can you access the first element of an ArrayList named as list?

Answer

```
list.get(0);
```

Status : Correct

Marks : 1/1

14. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(10);
        list.add(20);
        list.add(30);
        list.remove(1);
        System.out.println(list);
    }
}
```

Answer

[10, 20, 30]

Status : Wrong

Marks : 0/1

15. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<>();
        list.add("apple");
        list.add("banana");
        list.add("cherry");
        list.add("banana");
        System.out.println(list.lastIndexOf("banana"));
    }
}
```


}

Answer

3

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

Priya is analyzing encrypted messages in a research project. She wants to analyze the frequency of each character in a given paragraph. The characters should be stored in a TreeMap so that the output is sorted in ascending order of characters automatically.

You are required to build a Java program that:

Uses a `TreeMap<Character, Integer>` to count how many times each character appears in the message. Ignores spaces and considers only alphabets (case-sensitive). Outputs the frequencies of characters in sorted order.

You must use a TreeMap in the class named MessageAnalyzer.

Input Format

The first line of input contains an integer n, the number of lines in the message.

The next n lines each contain a string (the encrypted message line).

Output Format

The first line of output prints: "Character Frequency:"

Then print each character and its frequency in the format: "<character>: <count>"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
Hello World
Java

Output: Character Frequency:

H: 1

J: 1

W: 1

a: 2

d: 1

e: 1

l: 3

o: 2

r: 1

v: 1

Answer

```
import java.util.*;
class MessageAnalyzer {
    public void analyzeMessageFrequency(List<String> lines) {
        TreeMap<Character, Integer> frequencyMap = new TreeMap<>();

        for (String line : lines) {
            for (char ch : line.toCharArray()) {
                if (Character.isLetter(ch)) {
                    frequencyMap.put(ch, frequencyMap.getDefault(ch, 0) + 1);
                }
            }
        }
    }
}
```

```

    }
    System.out.println("Character Frequency:");
    for (Map.Entry<Character, Integer> entry : frequencyMap.entrySet()) {
        System.out.println(entry.getKey() + ": " + entry.getValue());
    }
}
}
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        List<String> lines = new ArrayList<>();
        for (int i = 0; i < n; i++) {
            lines.add(sc.nextLine());
        }

        MessageAnalyzer analyzer = new MessageAnalyzer();
        analyzer.analyzeMessageFrequency(lines);
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

A city traffic management system needs to track vehicles entering a toll booth. Each vehicle is uniquely identified by its registration number. The system should allow adding vehicles to a record, ensuring that no duplicate registration numbers exist. The vehicles should be stored in a HashSet, which does not guarantee any specific order.

Your task is to implement a program using a HashSet that allows adding vehicle details and displaying the records.

Input Format

The first line of input contains an integer N - the number of vehicles.

The next N lines contain details of each vehicle in the format: "RegNumber

OwnerName VehicleType"

1. RegNumber (String) - A unique registration number (Alphanumeric).
2. OwnerName (String) - The name of the vehicle owner.
3. VehicleType (String, Car, Bike, or Truck) - The type of vehicle.

If a vehicle with the same registration number is already present, ignore the duplicate entry.

Output Format

The output prints the unique vehicle records in any order (since HashSet does not maintain order).

Output format: "RegNumber OwnerName VehicleType"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

KA01AB1234 John Car
MH02CD5678 Alice Bike
DL03EF9012 Bob Truck
TN04GH3456 Mike Car
KA01AB1234 John Car

Output: TN04GH3456 Mike Car

KA01AB1234 John Car
MH02CD5678 Alice Bike
DL03EF9012 Bob Truck

Answer

```
import java.util.*;
class Vehicle {
    String regNumber;
    String ownerName;
    String vehicleType;
    private static HashSet<Vehicle> vehicleSet = new HashSet<>();
    public Vehicle(String regNumber, String ownerName, String vehicleType) {
        this.regNumber = regNumber;
        this.ownerName = ownerName;
```

```

        this.vehicleType = vehicleType;
    }
    public static void addVehicle(String regNumber, String ownerName, String
vehicleType) {
        vehicleSet.add(new Vehicle(regNumber, ownerName, vehicleType));
    }
    public static void displayVehicles() {
        for (Vehicle v : vehicleSet) {
            System.out.println(v);
        }
    }
    public boolean equals(Object obj) {
        if (this == obj) return true;
        if (obj == null || getClass() != obj.getClass()) return false;
        Vehicle vehicle = (Vehicle) obj;
        return regNumber.equals(vehicle.regNumber);
    }
    public int hashCode() {
        return Objects.hash(regNumber);
    }
    public String toString() {
        return regNumber + " " + ownerName + " " + vehicleType;
    }
}class TollBoothSystem {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();
        for (int i = 0; i < n; i++) {
            String regNumber = sc.next();
            String ownerName = sc.next();
            String vehicleType = sc.next();
            Vehicle.addVehicle(regNumber, ownerName, vehicleType);
        }
        Vehicle.displayVehicles();
        sc.close();
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 9_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Assist Pranitha in developing a program that takes an integer N as input, representing the number of names to be read. Then read N names and store them in an ArrayList. Finally, input a search string and output the frequency of that string in the list of names.

Note: Some parts of the code are provided as snippets, and you need to complete the remaining sections by writing the necessary code.

Input Format

The first line of input consists of an integer N, representing the number of names to be read.

The following N lines consist of N names, as a string.

The last line consists of a string, representing the name to be searched.

Output Format

The output prints a single integer, representing the frequency of the specified name in the given list.

If the specified name is not found, print 0.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

Alice

Bob

Ankit

Alice

Pranitha

Alice

Output: 2

Answer

```
import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;

public class Main {

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();

        List<String> names = new ArrayList<>();
        for (int i = 0; i < n; i++) {
            names.add(sc.nextLine());
        }

        String search = sc.nextLine();
```

```
int count = 0;
for (String name : names) {
    if (name.equals(search)) {
        count++;
    }
}

System.out.println(count);
sc.close();
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 9_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Bobby is tasked with processing a sequence of numbers from a monitoring system. He needs to extract a strictly increasing subsequence using an ArrayList. The program should dynamically add numbers to the ArrayList only if they are greater than the last number currently stored in the list. Bobby aims to efficiently utilize the dynamic resizing and indexing features of the ArrayList to solve this problem.

Help Bobby implement this solution.

Input Format

The first line of input consists of an integer N, representing the number of elements.

The second line consists of N space-separated integers, representing the elements.

Output Format

The output prints the list of integers in increasing sequence, ignoring out-of-order elements.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 7

3 5 9 1 11 7 13

Output: [3, 5, 9, 11, 13]

Answer

```
import java.util.ArrayList;
import java.util.Scanner;
```

```
class NumberProcessor {
    private ArrayList<Integer> numList;

    public NumberProcessor(ArrayList<Integer> numList) {
        this.numList = numList;
    }

    public void processNumbers() {
        ArrayList<Integer> filteredList = new ArrayList<>();
        for (int num : numList) {
            if (filteredList.isEmpty() || num > filteredList.get(filteredList.size() - 1)) {
                filteredList.add(num);
            }
        }
        System.out.println(filteredList);
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number_of_elements = input.nextInt();
```

```
    if (number_of_elements <= 0) {  
        return;  
    }  
  
    ArrayList<Integer> numList = new ArrayList<>();  
    for (int ctr = 0; ctr < number_of_elements; ctr++) {  
        numList.add(input.nextInt());  
    }  
  
    NumberProcessor processor = new NumberProcessor(numList);  
    processor.processNumbers();  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 9_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Vikram loves listening to music and wants to create a simple playlist manager using Java Collections. The playlist supports the following operations:

"ADD <song>" Adds the song to the end of the playlist. "REMOVE <song>" Removes the first occurrence of the song from the playlist. If the song is not found, do nothing. "SHOW" Displays all songs in the playlist in order. If the playlist is empty, print "EMPTY". "NEXT" Moves to the next song in the playlist and prints its name. If the playlist is empty, print "EMPTY".

The playlist maintains a "current song" position that starts at the first song when it's added. The NEXT command moves to the next song and prints it, wrapping around to the first song after reaching the last song. When removing songs, the current position adjusts accordingly to maintain

proper navigation.

Help Vikram implement this playlist manager.

Input Format

The first line of the input consists of an integer n, the number of operations.

The next n lines, each containing a command:

- "ADD <song>"
- "REMOVE <song>"
- "SHOW"
- "NEXT"

Output Format

For each "SHOW" command, print the songs in order, separated by spaces.

For each "NEXT" command, print the next song in the playlist.

If no song exists, print "EMPTY".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 7

ADD song1

ADD song2

SHOW

NEXT

REMOVE song2

SHOW

NEXT

Output: song1 song2

song2

song1

song1

Answer

```
import java.util.*;
class Playlist {
    private LinkedList<String> playlist;
    private int currentIndex;

    public Playlist() {
        playlist = new LinkedList<>();
        currentIndex = -1;
    }

    public void addSong(String song) {
        playlist.add(song);
        if (currentIndex == -1) {
            currentIndex = 0;
        }
    }

    public void removeSong(String song) {
        int idx = playlist.indexOf(song);
        if (idx != -1) {
            playlist.remove(idx);
            if (playlist.isEmpty()) {
                currentIndex = -1;
            } else if (idx <= currentIndex && currentIndex > 0) {
                currentIndex--;
            }
        }
    }

    public void showPlaylist() {
        if (playlist.isEmpty()) {
            System.out.println("EMPTY");
        } else {
            for (String s : playlist) {
                System.out.print(s + " ");
            }
            System.out.println();
        }
    }

    public void nextSong() {
        if (playlist.isEmpty()) {
```



```

        System.out.println("EMPTY");
    } else {
        currentIndex++;
        if (currentIndex >= playlist.size()) {
            currentIndex = 0;
        }
        System.out.println(playlist.get(currentIndex));
    }
}
}

class PlaylistManager {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());

        Playlist playlist = new Playlist();

        for (int i = 0; i < n; i++) {
            String command = sc.nextLine();

            if (command.startsWith("ADD ")) {
                String song = command.substring(4);
                playlist.addSong(song);
            } else if (command.startsWith("REMOVE ")) {
                String song = command.substring(7);
                playlist.removeSong(song);
            } else if (command.equals("SHOW")) {
                playlist.showPlaylist();
            } else if (command.equals("NEXT")) {
                playlist.nextSong();
            }
        }

        sc.close();
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a file management system, users are required to provide a valid file name when creating new files. The system enforces specific rules for file names to maintain consistency and avoid potential issues. Your task is to implement a Java program named FileNameValidator that takes user input for a file name and validates it according to the specified rules.

Rules for Valid File Name:

The file name must consist of alphanumeric characters (letters and digits) only. The file name must have a minimum length of 3 characters.

Implement a custom exception, FileNameValidator, to handle cases where the entered filename does not meet the specified criteria.

Input Format

The input consists of a string S, representing the desired filename.

Output Format

The output is displayed in the following format:

If the entered file name meets the specified criteria, the program outputs

"Valid file name"

If the entered file name does not meet the criteria and triggers the InvalidFileNameException, the program outputs

"Error: Invalid file name. It must be alphanumeric and have a minimum length of 3 characters."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: myfile123

Output: Valid file name

Answer

```
import java.util.Scanner;
class InvalidFileNameException extends Exception {
    public InvalidFileNameException(String message) {
        super(message);
    }
}
```

```
class FileNameValidator {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String fileName = sc.nextLine();

        try {
            validateFileName(fileName);
            System.out.println("Valid file name");
        }
        catch (InvalidFileNameException e) {
```

```
        System.out.println("Error: " + e.getMessage());
    }
    sc.close();
}
public static void validateFileName(String fileName) throws
InvalidFileNameException {
    if (fileName.length() < 3 || !fileName.matches("[A-Za-z0-9]+")) {
        throw new InvalidFileNameException("Invalid file name. It must be
alphanumeric and have a minimum length of 3 characters.");
    }
}
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 8_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. what is the output of the following code?

```
class MyException extends Exception {  
    public MyException(String message) {  
        super(message);  
    }  
}  
  
class Test {  
    public static void main(String[] args) {  
        try {  
            throw new MyException("Error occurred");  
        } catch (MyException e) {  
            System.out.println(e);  
        }  
    }  
}
```

```
}
```

Answer

MyException: Error occurred

Status : Correct

Marks : 1/1

2. What will be the output for the following code?

```
import java.io.*;
```

```
class TemperatureTooHighException extends Exception {  
    public TemperatureTooHighException(String message) {  
        super(message);  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        try {  
            int temperature = 110;  
            if (temperature > 100) {  
                throw new TemperatureTooHighException("Temperature too  
high");  
            }  
        } catch (TemperatureTooHighException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

Answer

Temperature too high

Status : Correct

Marks : 1/1

3. What will be the output for the following code?

```
class InvalidUsernameException extends Exception {
```

```
public InvalidUsernameException(String message) {  
    super(message);  
}  
}  
  
class Test {  
    public static void main(String[] args) {  
        try {  
            String username = "abc";  
            if (username.length() < 5) {  
                throw new InvalidUsernameException("Username must be at  
least 5 characters long");  
            }  
        } catch (InvalidUsernameException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

Answer

Username must be at least 5 characters long

Status : Correct

Marks : 1/1

4. What will happen if a checked custom exception is thrown inside a method without being caught or declared?

Answer

Compilation Error

Status : Correct

Marks : 1/1

5. What will be the output for the following code?

```
class NegativeBalanceException extends Exception {  
    public NegativeBalanceException(String message) {  
        super(message);  
    }  
}
```

```

    }
    class Test {
        public static void main(String[] args) {
            try {
                double balance = -500;
                if (balance < 0) {
                    throw new NegativeBalanceException("Balance cannot be
negative");
                }
            } catch (NegativeBalanceException e) {
                System.out.println("Error: " + e.getMessage());
            }
        }
    }
}

```

Answer

Error: Balance cannot be negative

Status : Correct

Marks : 1/1

6. What will be the output for the following code?

```

class InvalidVotingAgeException extends Exception {
    public InvalidVotingAgeException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int age = 15;
            if (age < 18) {
                throw new InvalidVotingAgeException("You are not eligible to
vote");
            }
            System.out.println("Eligible to vote");
        } catch (InvalidVotingAgeException e) {

```



```
        System.out.println(e.getMessage());
    }
}
}
```

Answer

You are not eligible to vote

Status : Correct

Marks : 1/1

7. How do you create an unchecked custom exception?

Answer

By extending RuntimeException

Status : Correct

Marks : 1/1

8. Which of the following is true about custom exceptions?

Answer

Custom exceptions must extend either Exception or RuntimeException

Status : Correct

Marks : 1/1

9. What will be the output for the following code?

```
import java.io.*;

class OutOfStockException extends Exception {
    public OutOfStockException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int stock = 0;
```

```

        if (stock == 0) {
            throw new OutOfStockException("Item is out of stock");
        }
    } catch (OutOfStockException e) {
        System.out.println(e.getMessage());
    }
}
}

```

Answer

Item is out of stock

Status : Correct

Marks : 1/1

10. What will be the output of the following code?

```

class MyException extends Exception {
    public MyException() {
        super("Default Exception Message");
    }
}

class Test {
    public static void main(String[] args) {
        try {
            throw new MyException();
        } catch (MyException e) {
            System.out.println(e.getMessage());
        }
    }
}

```

Answer

Default Exception Message

Status : Correct

Marks : 1/1

11. Which keyword is used to explicitly throw a custom exception?

Answer

throw

Status : Correct

Marks : 1/1

12. What will be the output for the following code?

```
import java.io.*;
```

```
class UnderageException extends Exception {  
    public UnderageException(String message) {  
        super(message);  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        try {  
            int age = 17;  
            if (age < 18) {  
                throw new UnderageException("Underage, cannot proceed");  
            }  
        } catch (UnderageException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

Answer

Underage, cannot proceed

Status : Correct

Marks : 1/1

13. what is the output of the following code?

```
class MyException extends Exception {  
    public MyException(String message) {  
        super(message);  
    }  
}
```

```

    }
}

class Test {
    static void check() throws MyException {
        throw new MyException("Custom Exception Occurred");
    }

    public static void main(String[] args) {
        try {
            check();
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
    }
}

```

Answer

Custom Exception Occurred

Status : Correct

Marks : 1/1

14. What is the purpose of a custom exception in Java?

Answer

To create user-defined exceptions for specific scenarios

Status : Correct

Marks : 1/1

15. What will be the output for the following code?

```

import java.io.*;

class NegativeAgeException extends Exception {
    public NegativeAgeException(String message) {
        super(message);
    }
}

```

```
class Test {  
    public static void main(String[] args) {  
        try {  
            int age = -5;  
            if (age < 0) {  
                throw new NegativeAgeException("Age cannot be negative");  
            }  
        } catch (NegativeAgeException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

Answer

Age cannot be negative

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

A local municipality is implementing an online voting system for a community event and wants to ensure that only eligible voters (those aged 18 or older) can participate.

Your task is to develop a program that validates the age of individuals attempting to vote online. If the user's age is below 18, the program should throw a custom exception, `InvalidAgeException`, preventing them from casting their vote. If the input is invalid, catch the appropriate `InputMismatchException` and print the in-built exception message.

Input Format

The input consists of an integer representing the age.

Output Format

If the age is 18 or older, print "Eligible to vote"

If the age is below 18, print "Exception occurred: InvalidAgeException: Age is not valid to vote"

If there is any other type of exception, print "An error occurred: " followed by the in-built exception message.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20

Output: Eligible to vote

Answer

```
import java.util.Scanner;
import java.util.InputMismatchException;

// Custom Exception
class InvalidAgeException extends Exception {
    public InvalidAgeException(String message) {
        super(message);
    }
}

class VotingEligibility {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        try {
            int age = scanner.nextInt();
            validateAge(age);
            System.out.println("Eligible to vote");
        }
        catch (InvalidAgeException e) {
            System.out.println("Exception occurred: InvalidAgeException: " +
e.getMessage());
        }
        catch (InputMismatchException e) {
```

```
        System.out.println("An error occurred: " + e);
    }
    catch (Exception e) {
        System.out.println("An error occurred: " + e.getMessage());
    }
    finally {
        scanner.close();
    }
}
```

```
// Method to validate age
public static void validateAge(int age) throws InvalidAgeException {
    if (age < 18) {
        throw new InvalidAgeException("Age is not valid to vote");
    }
}
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a user registration system, there is a requirement to implement a username validation module. Users attempting to register must adhere to specific criteria for their usernames to be considered valid.

Your task is to develop a program that takes user input for a desired username and validates it according to the following rules:

The username must not contain any spaces. The username must be at least 5 characters long.

Implement a custom exception, `InvalidUsernameException`, to handle cases where the entered username does not meet the specified criteria.

Input Format

The input consists of a string S, representing the desired username.

Output Format

If the username is valid, print "Username is valid: [S]".

If the username is invalid:

1. If the username is short, print "Invalid Username: Username must be at least 5 characters long"
2. If the username contains spaces, print "Invalid Username: Username cannot contain spaces"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: John

Output: Invalid Username: Username must be at least 5 characters long

Answer

```
import java.util.Scanner;
```

```
class InvalidUsernameException extends Exception {  
    public InvalidUsernameException(String message) {  
        super(message);  
    }  
}
```

```
class UsernameValidator {
```

```
    public static void validateUsername(String username) throws  
InvalidUsernameException {  
        if (username.contains(" ")) {  
            throw new InvalidUsernameException("Username cannot contain  
spaces");  
        } else if (username.length() < 5) {  
            throw new InvalidUsernameException("Username must be at least 5  
characters long");  
        }  
    }  
}
```

```
}  
  
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    String username = scanner.nextLine();  
    scanner.close();  
  
    try {  
        validateUsername(username);  
        System.out.println("Username is valid: " + username);  
    } catch (InvalidUsernameException e) {  
        System.out.println("Invalid Username: " + e.getMessage());  
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Write a program to validate the email address and display suitable exceptions if there is any mistake.

Create 3 custom exception classes as below

DotException AtTheRateException DomainException

A typical email address should have a "." character, and a "@" character, and also the domain name should be valid. Valid domain names for practice be 'in', 'com', 'net', or 'biz'.

Display Invalid Dot usage, Invalid @ usage, or Invalid Domain message based on email id.

Get the email address from the user, validate the email by checking the

above-mentioned criteria, and print the validity status of the input email address.

Input Format

The first line of input contains the email to be validated.

Output Format

The output prints a Valid email address or an Invalid email address along with the suitable exception

If email ends with . or contains not exactly one . after @, it throws:

DotException: Invalid Dot usage

Invalid email address

If @ appears not exactly once, it throws:

AtTheRateException: Invalid @ usage

Invalid email address

If the part after the last dot is not among accepted domains:

DomainException: Invalid Domain

Invalid email address

If all conditions satisfied then print:

Valid email address

Refer to the sample input and output for format specifications.

Sample Test Case

Input: sample@gmail.com

Output: Valid email address

Answer

```
import java.util.Scanner;
```

```
class DotException extends Exception {  
    public DotException(String message) {  
        super(message);  
    }  
}
```

```
class AtTheRateException extends Exception {  
    public AtTheRateException(String message) {  
        super(message);  
    }  
}
```

```
class DomainException extends Exception {  
    public DomainException(String message) {  
        super(message);  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        String email = scanner.nextLine();  
        scanner.close();
```

```
        try {  
            validateEmail(email);  
            System.out.println("Valid email address");  
        }
```

```
        catch (DotException | AtTheRateException | DomainException e) {  
            System.out.println(e.getClass().getSimpleName() + ": " + e.getMessage());  
            System.out.println("Invalid email address");  
        }
```

```

    }
}

public static void validateEmail(String email)
    throws DotException, AtTheRateException, DomainException {

    int atCount = email.length() - email.replace("@", "").length();
    if (atCount != 1 || email.startsWith("@") || email.endsWith("@") ||
email.contains("@@")) {
        throw new AtTheRateException("Invalid @ usage");
    }
    if (email.endsWith(".") || email.contains("..")) {
        throw new DotException("Invalid Dot usage");
    }
    int atIndex = email.indexOf('@');
    int lastDot = email.lastIndexOf('.');
    if (lastDot < atIndex || lastDot == email.length() - 1) {
        throw new DotException("Invalid Dot usage");
    }
    String domain = email.substring(lastDot + 1);
    if (!(domain.equals("in") || domain.equals("com") || domain.equals("net") ||
domain.equals("biz"))) {
        throw new DomainException("Invalid Domain");
    }
}
}
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 7_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. Which of the following statements is true regarding default methods in Java interfaces?

Answer

A default method can be overridden in a class implementing the interface.

Status : Correct

Marks : 1/1

2. What is the output of the following code?

```
interface A {  
    default void show() {  
        System.out.println("A's Default Method");  
    }  
}
```



```
class B {  
    public void show() {  
        System.out.println("B's Method");  
    }  
}
```

```
class C extends B implements A {  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.show();  
    }  
}
```

Answer

B's Method

Status : Correct

Marks : 1/1

3. What is the output of the following code?

```
interface MathOperations {  
    static int square(int x) {  
        return x * x;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        System.out.println(MathOperations.square(5));  
    }  
}
```

Answer

25

Status : Correct

Marks : 1/1

4. Can a Java interface contain both default and static methods?

Answer

Yes, an interface can have both default and static methods.

Status : Correct

Marks : 1/1

5. How can a class explicitly call a default method from an interface if there is a naming conflict?

Answer

Using InterfaceName.super.methodName();

Status : Correct

Marks : 1/1

6. What is the output of the following code?

```
interface A {  
    static void display() {  
        System.out.println("Static method in A");  
    }  
}
```

```
class B implements A {  
    static void display() {  
        System.out.println("Static method in B");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        B.display();  
    }  
}
```

Answer

Static method in B

Status : Correct

Marks : 1/1

7. What is the output of the following code?

```
interface A {  
    default void show() {  
        System.out.println("A's Default Method");  
    }  
}
```

```
interface B {  
    default void show() {  
        System.out.println("B's Default Method");  
    }  
}
```

```
class C implements A, B {  
    public void show() {  
        A.super.show();  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.show();  
    }  
}
```

Answer

A's Default Method

Status : Correct

Marks : 1/1

8. What is the output of the following code?

```
interface X {  
    default void show() {  
        System.out.println("X's Default Method");  
    }  
}
```

```
interface Y {  
    default void show() {  
        System.out.println("Y's Default Method");  
    }  
}
```

```
class Z implements X, Y {  
    public void show() {  
        System.out.println("Z's Method");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Z obj = new Z();  
        obj.show();  
    }  
}
```

Answer

Z's Method

Status : Correct

Marks : 1/1

9. How do you call a static method from an interface MyInterface?

Answer

MyInterface.staticMethod();

Status : Correct

Marks : 1/1

10. If a class implements two interfaces that have the same default method, what must the class do?

Answer

The class must override the method to resolve ambiguity.

Status : Correct

Marks : 1/1

11. Which of the following is the correct way to declare an interface in Java?

Answer

```
interface Vehicle { void start();}
```

Status : Correct

Marks : 1/1

12. What happens when an implementing class does not override a default method from an interface?

Answer

The default method's implementation from the interface will be used.

Status : Correct

Marks : 1/1

13. What is the primary purpose of static methods in Java interfaces?

Answer

They allow an interface to provide helper methods without requiring an implementing class.

Status : Correct

Marks : 1/1

14. Consider a class implementing an interface and extending a class, both having a method with the same name. Which method gets called?

Answer

The method from the superclass

Status : Correct

Marks : 1/1

15. Which of the following statements about Java interfaces is true?

Answer

A class can implement multiple interfaces.

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Elsa, a busy professional, is using a scheduling application to plan her meetings efficiently. The application requires users to input meeting durations in minutes, ensuring that the duration is a positive integer and does not exceed 240 minutes (4 hours). Elsa needs a program to assist her in scheduling meetings securely with proper exception handling.

Create a Java class named ElsaMeetingScheduler. Implement a custom exception: InvalidDurationException for invalid meeting duration entries. Implement the main method to interactively take user input for a meeting duration. Implement the validateMeetingDuration method to validate the meeting duration based on the specified rules and throw a custom exception if the validation fails. Print appropriate success or error messages based on the meeting duration.

Implement a custom exception, `InvalidDurationException`, to handle cases where the entered meeting duration does not meet the specified criteria.

Input Format

The input consists of an integer value 'n', representing the meeting duration.

Output Format

The output is displayed in the following format:

If the entered meeting duration meets the specified criteria, the program outputs

"Meeting scheduled successfully!"

If the entered meeting duration is invalid, the program outputs an error message indicating the issue.

"Error: Invalid meeting duration. Please enter a positive integer not exceeding 240 minutes (4 hours)."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 120

Output: Meeting scheduled successfully!

Answer

```
import java.util.Scanner;

class InvalidDurationException extends Exception {
    public InvalidDurationException(String message) {
        super(message);
    }
}

class ElsaMeetingScheduler {
    public static void validateMeetingDuration(int duration) throws
InvalidDurationException {
        if (duration <= 0 || duration > 240) {
```



```
        throw new InvalidDurationException("Invalid meeting duration. Please  
        enter a positive integer not exceeding 240 minutes (4 hours).");
```

```
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    int duration = scanner.nextInt();  
    scanner.close();
```

```
    try {  
        validateMeetingDuration(duration);  
        System.out.println("Meeting scheduled successfully!");  
    } catch (InvalidDurationException e) {  
        System.out.println("Error: " + e.getMessage());
```

```
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Elsa, a busy professional, is using a scheduling application to plan her meetings efficiently. The application requires users to input meeting durations in minutes, ensuring that the duration is a positive integer and does not exceed 240 minutes (4 hours). Elsa needs a program to assist her in scheduling meetings securely with proper exception handling.

Create a Java class named ElsaMeetingScheduler. Implement a custom exception: InvalidDurationException for invalid meeting duration entries. Implement the main method to interactively take user input for a meeting duration. Implement the validateMeetingDuration method to validate the meeting duration based on the specified rules and throw a custom exception if the validation fails. Print appropriate success or error messages based on the meeting duration.

Implement a custom exception, `InvalidDurationException`, to handle cases where the entered meeting duration does not meet the specified criteria.

Input Format

The input consists of an integer value 'n', representing the meeting duration.

Output Format

The output is displayed in the following format:

If the entered meeting duration meets the specified criteria, the program outputs

"Meeting scheduled successfully!"

If the entered meeting duration is invalid, the program outputs an error message indicating the issue.

"Error: Invalid meeting duration. Please enter a positive integer not exceeding 240 minutes (4 hours)."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 120

Output: Meeting scheduled successfully!

Answer

```
import java.util.Scanner;

class InvalidDurationException extends Exception {
    public InvalidDurationException(String message) {
        super(message);
    }
}

class ElsaMeetingScheduler {
    public static void validateMeetingDuration(int duration) throws
InvalidDurationException {
        if (duration <= 0 || duration > 240) {
```

```
        throw new InvalidDurationException("Invalid meeting duration. Please  
        enter a positive integer not exceeding 240 minutes (4 hours).");  
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    int duration = scanner.nextInt();  
    scanner.close();  
  
    try {  
        validateMeetingDuration(duration);  
        System.out.println("Meeting scheduled successfully!");  
    } catch (InvalidDurationException e) {  
        System.out.println("Error: " + e.getMessage());  
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 7_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Raj is curious about how old he is in the current year.

He has asked you to create a simple program that calculates a person's age based on their birth year. You decide to implement this functionality using the AgeCalculator interface and the HumanAgeCalculator class.

Note: The current year is 2024. Calculate the current age by using the formula: current year - birth year.

Input Format

The input consists of an integer representing the birth year.

Output Format

The output displays "You are X years old." where X is an integer representing the calculated age based on the entered birth year.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1934

Output: You are 90 years old.

Answer

```
import java.util.Scanner;
// You are using Java
import java.util.Scanner;

interface AgeCalculator {
    int calculateAge(int birthYear);
}

class HumanAgeCalculator implements AgeCalculator {
    public int calculateAge(int birthYear) {
        int currentYear = 2024;
        return currentYear - birthYear;
    }
}

class AgeCalculatorApp {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        AgeCalculator ageCalculator = new HumanAgeCalculator();

        int birthYear = scanner.nextInt();
        int age = ageCalculator.calculateAge(birthYear);

        System.out.println("You are " + age + " years old.");
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 7_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Maria, a software developer, is working on an inventory management system project using Java that utilizes an inventory interface to manage a store's products.

The interface should define two methods: `addProduct`, which adds a product by accepting its name, price, and quantity, and `calculateTotalValue`, which computes the total value of all products in the inventory. Implement the interface in a class called `SimpleInventory`, which internally manages a list of `Product` objects.

Each `Product` object should encapsulate the product's name, price, and quantity and include a method to calculate its value as $\text{price} \times \text{quantity}$. The system should allow users to dynamically add products to the inventory and calculate the total value of all products stored.

Help Maria achieve the task.

Input Format

The first line of input consists of an integer to choose one of the following options:

- 1 - to add a product to the inventory.
- 2 - to calculate and view the total inventory value.
- 3 - to exit the program.

For Choice 1 (Add Product):

The next input line is the string representing the product name as a string (single or multi-word, without quotes).

The next line is a double value representing the price as a decimal value

The next line is an integer value representing the quantity as an integer

For Choices 2 and 3, no additional input is required

Output Format

The output displays the results of the commands as follows:

- For the addProduct command, the program should display "Product added to inventory."
- For choice 2, the program should display "Total inventory value [totalvalue].
"The total value should be displayed with one decimal place. If there is no product in the inventory, print the total as 0.0.
- For choice 3, the program should exit

If the choice is not 1, 2, or 3, then print "Invalid choice. Please select a valid option (1/2/3).".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1

Laptop

800.0

3

2

5

3

Output: Product added to inventory.

Total inventory value: \$2400.0

Invalid choice. Please select a valid option (1/2/3).

Answer

```
import java.util.Scanner;
```

```
interface Inventory {  
    void addProduct(String name, double price, int quantity);  
    double calculateTotalValue();  
}
```

```
class Product {  
    String name;  
    double price;  
    int quantity;
```

```
    Product(String name, double price, int quantity) {  
        this.name = name;  
        this.price = price;  
        this.quantity = quantity;  
    }
```

```
    double getValue() {  
        return price * quantity;  
    }  
}
```

```
class SimpleInventory implements Inventory {  
    private Product[] products;  
    private int count;
```

```
    SimpleInventory(int capacity) {
```

```

products = new Product[capacity];
count = 0;
}

public void addProduct(String name, double price, int quantity) {
    if (count < products.length) {
        products[count] = new Product(name, price, quantity);
        count++;
        System.out.println("Product added to inventory.");
    } else {
        System.out.println("Inventory is full. Cannot add more products.");
    }
}

public double calculateTotalValue() {
    double total = 0.0;
    for (int i = 0; i < count; i++) {
        total += products[i].getValue();
    }
    return total;
}

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Inventory inventory = new SimpleInventory(10);
        while (true) {
            int choice = scanner.nextInt();
            if (choice == 1) {
                scanner.nextLine();
                String productName = scanner.nextLine();
                double price = scanner.nextDouble();
                int quantity = scanner.nextInt();
                inventory.addProduct(productName, price, quantity);
            } else if (choice == 2) {
                double totalValue = inventory.calculateTotalValue();
                System.out.println("Total inventory value: $" + totalValue);
            } else if (choice == 3) {
                break;
            } else {
                System.out.println("Invalid choice. Please select a valid option (1/2/3).");
            }
        }
    }
}

```

```
}  
    }  
    scanner.close();  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 7_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

A financial analyst, Alex, needs a program to calculate simple interest for various financial transactions. He requires a straightforward tool that takes in the principal amount, interest rate, and time in years and computes the interest.

The formula to be used is: $\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time} / 100$

Implement this functionality using the InterestCalculator interface and the SimpleInterestCalculator class.

Input Format

The first line of input consists of the principal amount P as a double value.

The second line of input consists of the annual interest rate r as a double value.

The third line of input consists of the number of years t as a positive integer, which is an integer value.

Output Format

The output displays the calculated simple interest in the following format: "Simple Interest: [interest_value]", Here, [interest_value] should be replaced with the actual interest value calculated by the program.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1000.00

5.00

2

Output: Simple Interest: 100.0

Answer

```
import java.util.Scanner;
```

```
interface InterestCalculator {  
    double simpleInterest(double principal, double rate, int time);  
}
```

```
class SimpleInterestCalculator implements InterestCalculator {  
    public double simpleInterest(double principal, double rate, int time) {  
        return (principal * rate * time) / 100.0;  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double principal = scanner.nextDouble();  
  
        double rate = scanner.nextDouble();
```

```
int time = scanner.nextInt();  
  
InterestCalculator calculator = new SimpleInterestCalculator();  
  
double interest = calculator.simpleInterest(principal, rate, time);  
  
System.out.println("Simple Interest: " + interest);  
  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 7_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Jaheer is working on a health monitoring system to help individuals calculate their Body Mass Index (BMI). He has implemented a basic BMI calculator and an interface called HealthCalculator. It should have a method called calculateBMI.

You are tasked with creating a program that takes weight and height as input, calculates the BMI using the BMICalculator class, and displays the result. If the height or weight is less than or equal to zero, then return -1.

Formula: $BMI = \text{weight} / (\text{height} * \text{height})$

Input Format

The first line of input consists of a double value W, the person's weight in kilograms.

The second line consists of a double value H, the height of the person in meters.

Output Format

The output displays "BMI: " followed by a double value, representing the calculated BMI, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 70.0

1.75

Output: BMI: 22.86

Answer

```
import java.util.Scanner;

interface HealthCalculator {
    double calculateBMI(double weight, double height);
}

class BMICalculator implements HealthCalculator {
    public double calculateBMI(double weight, double height) {
        if (weight <= 0 || height <= 0) {
            return -1; // invalid input case
        }
        return weight / (height * height);
    }
}

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        double weight = scanner.nextDouble();
        double height = scanner.nextDouble();

        BMICalculator bmiCalculator = new BMICalculator();
```

```
double bmi = bmiCalculator.calculateBMI(weight, height);  
  
System.out.printf("BMI: %.2f\n", bmi);  
  
    scanner.close();  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 6_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 13

Section 1 : MCQ

1. What will be the output of the following code?

```
class A {  
    int sum(int x) {  
        return x + 2;  
    }  
}
```

```
class B extends A {  
    int sum(int x) {  
        return super.sum(x) * 2;  
    }  
}
```

```
class C extends B {  
    int sum(int x) {
```

```

    return super.sum(x) - 3;
}
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        System.out.println(obj.sum(4));
    }
}

```

Answer

9

Status : Correct

Marks : 1/1

2. What will be the output of the following Java program?

```

class Parent {
    void show() {
        System.out.println("Parent class");
    }
}

class Child extends Parent {
    void show() {
        System.out.println("Child class");
    }
}

class Test {
    public static void main(String[] args) {
        Parent obj = new Child();
        obj.show();
    }
}

```

Answer

Child class

Status : Correct

Marks : 1/1

3. What will be the output of the following program?

```
class A {  
    public int i;  
    private int j;  
}  
class B extends A {  
    void display() {  
        super.j = super.i + 1;  
        System.out.println(super.i + " " + super.j);  
    }  
}  
class inheritance {  
    public static void main(String args[]) {  
        B obj = new B();  
        obj.i=1;  
        obj.j=2;  
        obj.display();  
    }  
}
```

Answer

Compile Time Error

Status : Correct

Marks : 1/1

4. What will be the output of the following Java program?

```
class Vehicle {  
    void start() {  
        System.out.println("Vehicle starts");  
    }  
}  
class Car extends Vehicle {  
  
    void start() {  
        System.out.println("Car starts");  
    }  
}
```

```
class ElectricCar extends Car {  
    void start() {  
        System.out.println("Electric Car starts silently");  
    }  
}  
class Test {  
    public static void main(String[] args) {  
        Vehicle v = new ElectricCar();  
        v.start();  
    }  
}
```

Answer

Electric Car starts silently

Status : Correct

Marks : 1/1

5. What will be the output of the following Java program?

```
class A {  
    int value = 10;  
    void display() {  
        System.out.println("A's display: " + value);  
    }  
}  
class B extends A {  
    int value = 20;  
    void display() {  
        System.out.println("B's display: " + value);  
    }  
}  
class Test {  
    public static void main(String[] args) {  
        A obj = new B();  
        obj.display();  
        System.out.println("Value: " + obj.value);  
    }  
}
```

Answer

B's display: 20 Value: 10

Status : Correct

Marks : 1/1

6. What will be the output of the following Java program?

```
class A {  
    void display() {  
        System.out.println("Class A");  
    }  
}  
  
class B extends A {  
    void show() {  
        System.out.println("Class B");  
    }  
}  
  
class C extends B {  
    void print() {  
        System.out.println("Class C");  
    }  
}  
  
class Test {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.display();  
        obj.show();  
        obj.print();  
    }  
}
```

Answer

Class A
Class B
Class C

Status : Correct

Marks : 1/1

7. Select the correct keyword for implementing inheritance through the class.

Answer

extends

Status : Correct

Marks : 1/1

8. Which of the following is the correct way for class B to inherit from class A?

Answer

class B extends class A {}

Status : Wrong

Marks : 0/1

9. What will be the output of the following Java program?

```
class Test {  
    void display(int a, int b) {  
        System.out.println("Method 1");  
    }  
    void display(double a, double b) {  
        System.out.println("Method 2");  
    }  
    public static void main(String[] args) {  
        Test obj = new Test();  
        obj.display(10, 10.0);  
    }  
}
```

Answer

Method 2

Status : Correct

Marks : 1/1

10. What will be the output of the following program?


```
class A {
    int x = 10;
}

class B extends A {
    int x = 20;
}

class C extends B {
    int x = 30;

    void display() {
        System.out.println(x);
        System.out.println(super.x);
    }
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        obj.display();
    }
}
```

Answer

3020

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
class A {
    void display() {
        System.out.println("Display A");
    }
}

class B extends A {
```

```
void display() {  
    System.out.println("Display B");  
}  
}  
  
class C extends B {  
    void display() {  
        super.display();  
    }  
}  
  
class Test {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.display();  
    }  
}
```

Answer

Display B

Status : Correct

Marks : 1/1

12. Which of the following is true about method overriding in Java?

Answer

The return type of the overriding method must be different from the overridden method

Status : Wrong

Marks : 0/1

13. What will be the output of the following Java program?

```
class Vehicle {  
    void startEngine() {  
        System.out.println("Vehicle engine started");  
    }  
}
```

```
class Car extends Vehicle {  
    void startEngine() {  
        System.out.println("Car engine started");  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        Vehicle myVehicle = new Car();  
        myVehicle.startEngine();  
    }  
}
```

Answer

Car engine started

Status : Correct

Marks : 1/1

14. What will be the output of the following Java program?

```
class Test {  
    void show(int a) {  
        System.out.println("Integer method");  
    }  
    void show(String s) {  
        System.out.println("String method");  
    }  
    public static void main(String[] args) {  
        Test obj = new Test();  
        obj.show(null);  
    }  
}
```

Answer

String method

Status : Correct

Marks : 1/1

15. What will be the output of the following program?

```
class Vehicle {  
    String type = "Vehicle";  
}  
  
class Car extends Vehicle {  
    String type = "Car";  
}  
  
class Test {  
    public static void main(String[] args) {  
        Car c = new Car();  
        System.out.println(c.type);  
    }  
}
```

Answer

Car

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Mr.Kapoor wants to create a program to calculate the volume of a Cuboid and a Cube using method overriding.

Implements a base class Cuboid with attributes for length, width, and height. Include a method calculateVolume() that computes the volume of the cuboid.

Extends the base class with a subclass Cube representing a cube, where all sides are equal. Override the calculateVolume() method in the Cube class to compute the volume of the cube.

The program should take user input for the dimensions of the cuboid and the side length of the cube and display the calculated volumes with two decimal places.

Input Format

The first line of input consists of 3 space-separated double values, representing the cuboid length, width, and height, respectively.

The second line consists of a double value, representing the side length of the cube.

Output Format

The first line of output prints the volume of the cuboid, rounded off to two decimal places.

The second line prints the volume of the cube, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 60.0 60.0 60.0
50.0

Output: Volume of Cuboid: 216000.00
Volume of Cube: 125000.00

Answer

```
import java.util.Scanner;

class Cuboid {
    protected double length;
    protected double width;
    protected double height;

    public Cuboid(double length, double width, double height) {
        this.length = length;
        this.width = width;
        this.height = height;
    }
}
```

```
    public double calculateVolume() {  
        return length * width * height;  
    }  
}
```

```
class Cube extends Cuboid {  
    private double side;
```

```
    public Cube(double side) {  
        super(side, side, side);  
        this.side = side;  
    }
```

```
    @Override  
    public double calculateVolume() {  
        return side * side * side;  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);
```

```
        double cuboidLength = scanner.nextDouble();  
        double cuboidWidth = scanner.nextDouble();  
        double cuboidHeight = scanner.nextDouble();
```

```
        // Regular object instantiation for Cuboid  
        Cuboid cuboid = new Cuboid(cuboidLength, cuboidWidth, cuboidHeight);  
        System.out.printf("Volume of Cuboid: %.2f\n", cuboid.calculateVolume());
```

```
        double cubeSide = scanner.nextDouble();
```

```
        // Upcasting - Using superclass reference for subclass object (DMD)  
        Cuboid cube = new Cube(cubeSide); // Upcasting  
        System.out.printf("Volume of Cube: %.2f", cube.calculateVolume()); // Calls  
        Cube's method dynamically
```

```
        scanner.close();  
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem statement:

Tim was tasked with developing a grocery shopping app. You have a class hierarchy that includes Item, Produce, and OrganicProduce. Your goal is to calculate the total cost of a shopping list, which may contain a mix of regular produce and organic produce items. Additionally, you need to apply discounts to organic items. Apply a 10% discount on organic produce items

Class Hierarchy:

Item: Base class for all items.

Produce: Subclass of Item for regular produce items.

OrganicProduce: Subclass of Produce for organic produce items.

Input Format

The first line of input consists of an integer, 'n'.

For each 'n' item, the user will provide:

- A string 'type' representing the item type ('Regular' or 'Organic').
- A string 'name' represents the item name.
- A double 'price' represents the item price.

Output Format

The output will display the total cost of the shopping list, including discounts on organic items.

Refer to the sample output for format specifications.

Sample Test Case

Input: 1

Regular Banana 1.99

Output: 1.99

Answer

```
import java.util.Scanner;

class Item {
    protected String name;
    protected double price;

    public Item(String name, double price) {
        this.name = name;
        this.price = price;
    }

    public double calculateCost() {
        return price;
    }
}
```

```
class Produce extends Item {  
    public Produce(String name, double price) {  
        super(name, price);  
    }  
}
```

```
@Override  
public double calculateCost() {  
    return price;  
}  
}
```

```
class OrganicProduce extends Produce {  
    public OrganicProduce(String name, double price) {  
        super(name, price);  
    }  
}
```

```
@Override  
public double calculateCost() {  
    return price * 0.9;  
}  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);
```

```
        int n = sc.nextInt();  
        sc.nextLine(); // Consume newline
```

```
        double totalCost = 0.0;
```

```
        for (int i = 0; i < n; i++) {  
            String type = sc.next();  
            String name = sc.next();  
            double price = sc.nextDouble();
```

```
            if (type.equals("Regular")) {  
                Item item = new Produce(name, price);  
                totalCost += item.calculateCost();  
            } else if (type.equals("Organic")) {  
                Item item = new OrganicProduce(name, price);
```

```
        totalCost += item.calculateCost();
    }
}

System.out.printf("%.2f%n", totalCost);
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Preethi is working on a project to automate sales tax calculations for items in a store. She wants to create a program that takes the price of an item and the sales tax rate as input and calculates the final price of the item after applying the sales tax.

Write a program using the class SalesTaxCalculator, which contains an overloaded method named calculateFinalPrice to handle both integer and double inputs. The program should also include a Main class that takes user input, calls the appropriate method from SalesTaxCalculator, and prints the final price of the item.

Formula Used: Final price = price + ((price * sales tax rate) / 100)

Input Format

The first line of input consists of an integer price (the price of the item for integer inputs).

The second line of input consists of an integer taxRate (the sales tax rate for integer inputs).

The third line of input consists of a double price (the price of the item for double inputs).

The fourth line of input consists of a double taxRate (the sales tax rate for double inputs).

Output Format

The first line of output prints an integer, representing the final price of the item after applying the sales tax for integer inputs (a and b).

The second line prints a double value, representing the final price of the item after applying the sales tax for double-value inputs (m and n), rounded to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 100

10

100.0

5.0

Output: 110

105.00

Answer

```
import java.util.Scanner;
```

```
class SalesTaxCalculator {
```

```
    public static int calculateFinalPrice(int price, int taxRate) {  
        return price + (price * taxRate / 100);  
    }
```

```
    public static double calculateFinalPrice(double price, double taxRate) {
```

```
        return price + ((price * taxRate) / 100);
    }
}

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int intPrice = scanner.nextInt();
        int intTaxRate = scanner.nextInt();
        double doublePrice = scanner.nextDouble();
        double doubleTaxRate = scanner.nextDouble();

        int finalPriceInt = SalesTaxCalculator.calculateFinalPrice(intPrice,
intTaxRate);
        double finalPriceDouble =
SalesTaxCalculator.calculateFinalPrice(doublePrice, doubleTaxRate);

        System.out.println(finalPriceInt);
        System.out.format("%.2f", finalPriceDouble);
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Alice is managing an online store and wants to implement a program using inheritance to calculate the selling price of products after applying discounts.

Guide her by following the instructions:

Create a base class called Product with a public double attribute price. Create a subclass called DiscountedProduct, which extends Product and includes a private double attribute discount rate. This subclass has a method called calculateSellingPrice() to determine the final selling price after applying the discount.

Formula: Discounted selling price = price * (1 - discount rate)

Input Format

The first line of input consists of a double value p, the initial price of the product.

The second line consists of a double value d, the discount rate.

Output Format

The output prints "Rs. X", where X is a double value, representing the calculated discounted selling price, rounded off to two decimal places.

If the discount rate is greater than 1, print "Not applicable".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 50.00

0.20

Output: Rs. 40.00

Answer

```
import java.util.Scanner;
```

```
class Product {  
    public double price;  
  
    public Product(double price) {  
        this.price = price;  
    }  
}
```

```
class DiscountedProduct extends Product {  
    private double discountRate;  
  
    public DiscountedProduct(double price, double discountRate) {  
        super(price);  
        this.discountRate = discountRate;  
    }  
  
    public double calculateSellingPrice() {  
        if (discountRate > 1) {
```

```
        return -1; // indicates invalid discount
    }
    return price * (1 - discountRate);
}
}
```

```
class ProductPricing {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        double initialPrice = scanner.nextDouble();
        double discountRate = scanner.nextDouble();
        DiscountedProduct discountedProduct = new
DiscountedProduct(initialPrice, discountRate);
        double sellingPrice = discountedProduct.calculateSellingPrice();

        if (sellingPrice >= 0) {
            System.out.printf("Rs. %.2f%n", sellingPrice);
        } else {
            System.out.println("Not applicable");
        }
        scanner.close();
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Elsa subscribes to a premium service with a base monthly cost, a service tax and an extra feature cost. Assist her in writing an inheritance program that takes input for these values and calculates the total monthly cost.

Refer to the below class diagram:

Input Format

The first line of input consists of a double value, representing the base monthly cost.

The second line consists of a double value, representing the service tax.

The third line consists of a double value, representing the extra feature cost.

Output Format

The output prints "Rs. X" where X is a double value, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10.0

2.5

5.0

Output: Rs. 17.50

Answer

```
import java.util.Scanner;
```

```
class Subscription {  
    protected double baseMonthlyCost;  
    protected double serviceTax;  
  
    public Subscription(double baseMonthlyCost, double serviceTax) {  
        this.baseMonthlyCost = baseMonthlyCost;  
        this.serviceTax = serviceTax;  
    }  
  
    public double calculateMonthlyCost() {  
        return baseMonthlyCost + serviceTax;  
    }  
}
```

```
class PremiumSubscription extends Subscription {  
    private double extraFeatureCost;  
  
    public PremiumSubscription(double baseMonthlyCost, double serviceTax,  
double extraFeatureCost) {  
        super(baseMonthlyCost, serviceTax);  
        this.extraFeatureCost = extraFeatureCost;  
    }  
}
```

```
@Override
```

```
public double calculateMonthlyCost() {  
    return super.calculateMonthlyCost() + extraFeatureCost;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double baseMonthlyCost = scanner.nextDouble();  
        double serviceTax = scanner.nextDouble();  
        double extraFeatureCost = scanner.nextDouble();  
  
        PremiumSubscription premiumSubscription = new  
PremiumSubscription(baseMonthlyCost, serviceTax, extraFeatureCost);  
  
        double totalMonthlyCost = premiumSubscription.calculateMonthlyCost();  
  
        System.out.printf("Rs. %.2f%n", totalMonthlyCost);  
  
        scanner.close();  
    }  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 13

Section 1 : MCQ

1. What will be the output of the following code?

```
class Demo {  
    void printMessage() {  
        System.out.println("Hello from Demo");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Demo d = new Demo();  
        d.printMessage();  
    }  
}
```

Answer

Hello from Demo

Status : Correct

Marks : 1/1

2. What will be the output of the following code?

```
class Ball {  
    int size = 11;  
}  
  
class Game {  
    public static void main(String[] args) {  
        Ball b1 = new Ball();  
        Ball b2 = new Ball();  
        b2.size = 10;  
        System.out.println(b1.size);  
    }  
}
```

Answer

11

Status : Correct

Marks : 1/1

3. What will be the output of the following code?

```
class Box {  
    int length = 5;  
    int width = 4;  
  
    int area() {  
        return length * width;  
    }  
  
    public static void main(String[] args) {  
        Box b = new Box();  
        System.out.println("Area = " + b.area());  
    }  
}
```

Answer

Area = 20

Status : Correct

Marks : 1/1

4. What will be the output of the following code?

```
class Sample {  
    int x = 10;  
  
    void display() {  
        System.out.println("x = " + x);  
    }  
  
    public static void main(String[] args) {  
        Sample s = new Sample();  
        s.display();  
    }  
}
```

Answer

x = 10

Status : Correct

Marks : 1/1

5. What will be the output of the following code?

```
class Person {  
    int age = 18;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Person p = new Person();  
        p.age += 2;  
        System.out.println("Age: " + p.age);  
    }  
}
```


Answer

Age: 20

Status : Correct

Marks : 1/1

6. What will be the output of the following code?

```
class A {  
    int y = 30;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        A a1 = new A();  
        A a2 = new A();  
        a1.y = 50;  
        System.out.println(a2.y);  
    }  
}
```

Answer

50

Status : Wrong

Marks : 0/1

7. What will be the output of the following code?

```
class MathUtils {  
    int add(int x) {  
        return x + x;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        MathUtils m = new MathUtils();  
        System.out.println(m.add(5));  
    }  
}
```

```
}
```

Answer

10

Status : Correct

Marks : 1/1

8. What will be the output of the following code?

```
class A {  
    int p = 5;  
    int q = 2;  
}  
  
class Main {  
    public static void main(String[] args) {  
        A obj = new A();  
        System.out.println(obj.p + obj.q);  
    }  
}
```

Answer

7

Status : Correct

Marks : 1/1

9. What will be the output of the following code?

```
class Test {  
    private int value;  
    Test(int value) {  
        this.value = value;  
    }  
    public int getValue() {  
        return value;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {
```

```
Test obj = new Test(10);
System.out.println(obj.value);
}
}
```

Answer

Compile-time error

Status : Correct

Marks : 1/1

10. What will be the output of the following code?

```
class A {
    int val = 20;
}

public class Main {
    public static void main(String[] args) {
        A obj1 = new A();
        A obj2 = obj1;
        obj2.val += 5;
        System.out.println(obj1.val);
    }
}
```

Answer

25

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
class Person {
    String name;
    void setName(String n) {
        name = n;
    }
    void printName() {
        System.out.println(name);
    }
}
```

```
}  
}  
}  
  
class Test {  
    public static void main(String[] args) {  
        Person p = new Person();  
        p.printName();  
    }  
}
```

Answer

null

Status : Correct

Marks : 1/1

12. What will be the output of the following code?

```
class Alpha {  
    void greet(String name) {  
        System.out.println("Hello " + name);  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Alpha obj = new Alpha();  
        obj.greet("Anu");  
    }  
}
```

Answer

Hello Anu

Status : Correct

Marks : 1/1

13. What is the output of the following code?

```
class Box {  
    int height;
```

```

Box(int height) {
    this.height = height;
}
void modifyHeight(Box b) {
    b.height += 10;
}
}
public class Main {
    public static void main(String[] args) {
        Box b1 = new Box(20);
        b1.modifyHeight(b1);
        System.out.println(b1.height);
    }
}

```

Answer

Compile-time error

Status : Wrong

Marks : 0/1

14. What will be the output of the following code?

```

class A {
    int x = 50;
}

public class Main {
    public static void main(String[] args) {
        A obj1 = new A();
        A obj2 = obj1;
        obj2.x = 100;
        System.out.println(obj1.x);
    }
}

```

Answer

100

Status : Correct

Marks : 1/1

15. What will be the output of the following code?

```
class Box {  
    int volume(int l, int b, int h) {  
        return l * b * h;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Box b = new Box();  
        System.out.println(b.volume(2, 3, 4));  
    }  
}
```

Answer

24

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ram is working as a developer for BrightEdu Coaching Center, which wants to build a student fee management system.

Each student's enrollment has:

An Enrollment ID (integer) A Student Name (string) The Number of Subjects (integer)

The fee calculation rules are:

Registration Fee = 1000 units (flat for every student). Per Subject Fee = 800 units. If the student enrolls in more than 5 subjects, a 20% scholarship (discount) is applied on the total fee.

Ram has been asked to implement this system using:

A class with attributes for student details. A constructor to initialize student details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent student enrollments.

Finally, display each student's details and final fee.

Input Format

The first line of input contains an integer N, representing the number of students.

For each student:

- The next line contains the Enrollment ID (integer).
- The following line contains the student's name (string).
- The next line contains the Number of subjects (integer).

Output Format

For each student, print the details in the following format:

- Enrollment ID: <enrollment_id>
- Student Name: <student_name>
- Final Fee: <final_fee> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

1234

Ravi Kumar

3

Output: Enrollment ID: 1234

Student Name: Ravi Kumar

Final Fee: 3400.0

Answer

```
import java.util.Scanner;
```

```
class Student {  
    private int enrollmentId;
```



```
private String studentName;
private int numberOfSubjects;
public Student(int enrollmentId, String studentName, int numberOfSubjects) {
    this.enrollmentId = enrollmentId;
    this.studentName = studentName;
    this.numberOfSubjects = numberOfSubjects;
}
public void setEnrollmentId(int enrollmentId) {
    this.enrollmentId = enrollmentId;
}
public void setStudentName(String studentName) {
    this.studentName = studentName;
}
public void setNumberOfSubjects(int numberOfSubjects) {
    this.numberOfSubjects = numberOfSubjects;
}
public int getEnrollmentId() {
    return enrollmentId;
}
public String getStudentName() {
    return studentName;
}
public int getNumberOfSubjects() {
    return numberOfSubjects;
}
public double calculateFinalFee() {
    double registrationFee = 1000;
    double subjectFee = 800 * numberOfSubjects;
    double totalFee = registrationFee + subjectFee;
    if (numberOfSubjects > 5) {
        totalFee = totalFee * 0.8;
    }
    return totalFee;
}
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < n; i++) {
            int enrollmentId = Integer.parseInt(sc.nextLine());
            String studentName = sc.nextLine();
        }
    }
}
```

```
int numberOfSubjects = Integer.parseInt(sc.nextLine());
Student student = new Student(enrollmentId, studentName,
numberOfSubjects);
System.out.println("Enrollment ID: " + student.getEnrollmentId());
System.out.println("Student Name: " + student.getStudentName());
System.out.println("Final Fee: " + String.format("%.1f",
student.calculateFinalFee()));
    }
    sc.close();
}
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are working as a developer for CityCab, a taxi service company that wants to build a ride fare management system.

Each customer booking has:

A Booking ID (integer) A Customer Name (string) A Distance Travelled in km (double)

The fare calculation rules are:

Base Fare = 50 units (flat charge for every ride). Per km charge = 10 units/km. If the distance is greater than 20 km, a 10% discount is applied on the total fare.

You are required to implement this system using:

A class with attributes for booking details. A constructor to initialize booking details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customer rides.

Finally, display each booking's details and final fare.

Input Format

The first line of input contains an integer N, representing the number of bookings.

For each booking:

- The next line contains the booking ID (integer).
- The following line contains the customer's name (string).
- The next line contains the distance travelled (double).

Output Format

For each booking, print the details in the following format:

1. Booking ID: <booking_id>
2. Customer Name: <customer_name>
3. Final Fare: <final_fare> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

1234

Rahul Sharma

15

Output: Booking ID: 1234

Customer Name: Rahul Sharma

Final Fare: 200.0

Answer

```
import java.util.Scanner;
```

```
class Booking {
```

```

private int bookingId;
private String customerName;
private double distanceTravelled;
public Booking(int bookingId, String customerName, double distanceTravelled)
{
    this.bookingId = bookingId;
    this.customerName = customerName;
    this.distanceTravelled = distanceTravelled;
}
public void setBookingId(int bookingId) {
    this.bookingId = bookingId;
}
public void setCustomerName(String customerName) {
    this.customerName = customerName;
}
public void setDistanceTravelled(double distanceTravelled) {
    this.distanceTravelled = distanceTravelled;
}
public int getBookingId() {
    return bookingId;
}
public String getCustomerName() {
    return customerName;
}
public double getDistanceTravelled() {
    return distanceTravelled;
}
public double calculateFinalFare() {
    double baseFare = 50;
    double distanceFare = 10 * distanceTravelled;
    double totalFare = baseFare + distanceFare;
    if (distanceTravelled > 20) {
        totalFare = totalFare * 0.9;
    }

    return totalFare;
}
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
    }
}

```

```
for (int i = 0; i < n; i++) {  
    int bookingId = Integer.parseInt(sc.nextLine());  
    String customerName = sc.nextLine();  
    double distanceTravelled = Double.parseDouble(sc.nextLine());  
    Booking booking = new Booking(bookingId, customerName,  
distanceTravelled);  
    System.out.println("Booking ID: " + booking.getBookingId());  
    System.out.println("Customer Name: " + booking.getCustomerName());  
    System.out.println("Final Fare: " + String.format("%.1f",  
booking.calculateFinalFare()));  
}  
    sc.close();  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Neha is working as a developer for CityElectricity Board, which wants to build a household electricity billing system.

Each customer's electricity account has:

A Customer ID (integer) A Customer Name (string) Units Consumed (double)

The electricity bill is calculated based on these rules:

For the first 100 units 5 units charge per unit For the next 100 units (101–200) 7 units charge per unit For units above 200 10 units charge per unit If the total bill exceeds 2000 units, a 5% discount is applied on the final bill.

Neha has been asked to implement this system using:

A class with attributes for customer details. A constructor to initialize customer details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customers.

Finally, display each customer's details and final bill amount.

Input Format

The first line of input contains an integer N, representing the number of customers.

For each customer:

- The next line contains the Customer ID (integer).
- The following line contains the Customer Name (string).
- The next line contains the Units Consumed (double).

Output Format

For each customer, print the details in the following format:

Customer ID: <customer_id>

Customer Name: <customer_name>

Final Bill: <final_bill> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

1001

Ravi Kumar

80

Output: Customer ID: 1001

Customer Name: Ravi Kumar

Final Bill: 400.0

Answer

```
import java.util.Scanner;
```



```
class Customer {
    private int customerId;
    private String customerName;
    private double unitsConsumed;
    public Customer(int customerId, String customerName, double
unitsConsumed) {
        this.customerId = customerId;
        this.customerName = customerName;
        this.unitsConsumed = unitsConsumed;
    }
    public void setCustomerId(int customerId) {
        this.customerId = customerId;
    }
    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }
    public void setUnitsConsumed(double unitsConsumed) {
        this.unitsConsumed = unitsConsumed;
    }
    public int getCustomerId() {
        return customerId;
    }
    public String getCustomerName() {
        return customerName;
    }
    public double getUnitsConsumed() {
        return unitsConsumed;
    }
    public double calculateFinalBill() {
        double bill = 0.0;
        double units = unitsConsumed;
        if (units <= 100) {
            bill = units * 5;
        } else if (units <= 200) {
            bill = (100 * 5) + ((units - 100) * 7);
        } else {
            bill = (100 * 5) + (100 * 7) + ((units - 200) * 10);
        }
        if (bill > 2000) {
            bill = bill * 0.95;
        }
    }
}
```

```
        return bill;
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < n; i++) {
            int customerId = Integer.parseInt(sc.nextLine());
            String customerName = sc.nextLine();
            double unitsConsumed = Double.parseDouble(sc.nextLine());
            Customer customer = new Customer(customerId, customerName,
            unitsConsumed);
            System.out.println("Customer ID: " + customer.getCustomerId());
            System.out.println("Customer Name: " + customer.getCustomerName());
            System.out.println("Final Bill: " + String.format("%.1f",
            customer.calculateFinalBill()));
        }
        sc.close();
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 4_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 14

Section 1 : MCQ

1. Predict the output for the following code.

```
public class Main {  
    public static void main(String[] args) {  
        String a = "java";  
        char temp = a.charAt(1);  
        System.out.println(temp);  
    }  
}
```

Answer

a

Status : Correct

Marks : 1/1

2. What will be the output of the following program?

```
public class Main {  
    public static void main(String[] args) {  
        String str = "1234.34";  
        int a = Integer.parseInt(str);  
        System.out.println(a);  
    }  
}
```

Answer

NumberFormatException

Status : Correct

Marks : 1/1

3. What will be the output of the following program?

```
class Main {  
    public static void main(String[] args) {  
        String s1 = "EDUCATION";  
        String s2 = new String("EDUCATION");  
        String s3 = "EDUCATION";  
        if (s1 == s2) {  
            System.out.println("s1 and s2 equal");  
        }  
        else {  
            System.out.println("s1 and s2 not equal");  
        }  
        if (s1 == s3) {  
            System.out.println("s1 and s3 equal");  
        }  
        else {  
            System.out.println("s1 and s3 not equal");  
        }  
    }  
}
```

Answer

s1 and s2 not equal
s1 and s3 equal

Status : Correct

Marks : 1/1

4. What will be the output of the following program?

```
class Main {  
    public static void main(String[] args) {  
        String s = new String("5");  
        System.out.println(1 + 1111 + s + 1 + 1010);  
    }  
}
```

Answer

1112511010

Status : Correct

Marks : 1/1

5. Predict the output for the following code:

```
public class Main {  
    public static void main(String[] args) {  
        float a = 10.0f;  
        String temp = Float.toString(a);  
        System.out.println(temp);  
    }  
}
```

Answer

10.0

Status : Correct

Marks : 1/1

6. What will be the output of the following code?

```
class Main {  
    public static void main(String args[])  
    {  
        StringBuffer sb = new StringBuffer("Hello");  
        System.out.println("buffer before = " + sb);  
    }  
}
```

```

        System.out.println("charAt(1) before = " + sb.charAt(1));
        sb.setCharAt(1, 'i');
        sb.setLength(2);
        System.out.println("buffer after = " + sb);
        System.out.println("charAt(1) after = " + sb.charAt(1));
    }
}

```

Answer

buffer before = Hello charAt(1) before = e buffer after = Hi charAt(1) after = i

Status : Correct

Marks : 1/1

7. What is the output of the following code?

```

class Main
{
    public static void main(String args[])
    {
        StringBuffer c = new StringBuffer("Hello");
        c.delete(0,2);
        System.out.println(c);
    }
}

```

Answer

llo

Status : Correct

Marks : 1/1

8. Predict the output for the following code.

```

class Main {
    public static void main(String[] fruits) {
        String fruit1 = new String("apple");
        String fruit2 = new String("orange");
        String fruit3 = new String("pear");
        fruit3 = fruit1;
        fruit2 = fruit3;
    }
}

```

```
fruit1 = fruit2;
System.out.println(fruit1);
System.out.println(fruit2);
System.out.println(fruit3);
}
}
```

Answer

pearpearpear

Status : Wrong

Marks : 0/1

9. What will be the output of the following code?

```
class Main {
    public static void main(String args[]) {
        String s1 = "Hello i love java";
        String s2 = new String(s1);
        System.out.println((s1 == s2) + " " + s1.equals(s2));
    }
}
```

Answer

false true

Status : Correct

Marks : 1/1

10. What will be the output of the following program?

```
class Main {
    public static void main(String[] args) {
        String greet = "Welcome\n";
        System.out.print("String: " + greet);
        int length = greet.length();
        System.out.print("Length: " + length);
    }
}
```

Answer

String: WelcomeLength: 8

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
class Main {  
    public static void main(String args[]) {  
        char c[] = {'j', 'a', 'v', 'a'};  
        String s1 = new String(c);  
        String s2 = new String(s1);  
        System.out.println(s1);  
        System.out.println(s2);  
    }  
}
```

Answer

javajava

Status : Correct

Marks : 1/1

12. What will be the output of the following program?

```
class Main {  
    public static void main(String args[]) {  
        String name="Work Hard";  
        name.concat("Success");  
        System.out.println(name);  
    }  
}
```

Answer

Work Hard

Status : Correct

Marks : 1/1

13. What will be the output for the following code?

```
class Main {
```



```
public static void main(String[] args) {  
    String languages[] = { "C", "C++", "Java", "Python", "Ruby"};  
    for (String sample: languages) {  
        System.out.println(sample);  
    }  
}
```

Answer

CC++JavaPythonRuby

Status : Correct

Marks : 1/1

14. Predict the output for the following code:

```
class Main {  
    public static void main(String args[]) {  
        StringBuffer sb = new StringBuffer("I Java!");  
        sb.insert(5, "like ");  
        System.out.println(sb);  
    }  
}
```

Answer

I Javlike a!

Status : Correct

Marks : 1/1

15. What will be the output of the following program?

```
class Main {  
    public static void main(String args[]) {  
        StringBuffer sb = new StringBuffer("Hello");  
        System.out.println("buffer = " + sb);  
        System.out.println("length = " + sb.length());  
        System.out.println("capacity = " + sb.capacity());  
    }  
}
```

Answer

buffer = Hello length = 5 capacity = 21

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are working as a developer for CityBank, which wants to build a basic account management system.

Each customer at the bank has:

An Account Number (integer) A Customer Name (string) An Initial Balance (double)

The bank allows two types of transactions:

Deposit – increases the balance. Withdrawal – decreases the balance only if enough funds are available.

If the withdrawal amount is greater than the balance, the withdrawal should not happen, and the balance should remain the same.

You are required to implement this system using:

A class with attributes for account details. A constructor to initialize account details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customers.

Finally, display each customer's account details after all transactions.

Input Format

The first line of input contains an integer N, representing the number of customers.

For each customer:

- The next line contains the account number (integer).
- The following line contains the customer name (string).
- The next line contains the initial balance (double).
- The next line contains the deposit amount (double).
- The next line contains the withdrawal amount (double).

Output Format

For each customer, print the details in the following format:

1. Account Number: <account_number>
2. Customer Name: <customer_name>
3. Final Balance: <final_balance> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

1234

Rahul Sharma

5000

2000

3000

Output: Account Number: 1234

Customer Name: Rahul Sharma

Final Balance: 4000.0

Answer

```
import java.util.Scanner;

class BankAccount {
    private int accountNumber;
    private String customerName;
    private double balance;
    public BankAccount(int accountNumber, String customerName, double
balance) {
        this.accountNumber = accountNumber;
        this.customerName = customerName;
        this.balance = balance;
    }
    public void setAccountNumber(int accountNumber) {
        this.accountNumber = accountNumber;
    }

    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }
    public void setBalance(double balance) {
        this.balance = balance;
    }
    public int getAccountNumber() {
        return accountNumber;
    }
    public String getCustomerName() {
        return customerName;
    }
    public double getBalance() {
        return balance;
    }
    public void deposit(double amount) {
        if (amount > 0) {
            balance += amount;
        }
    }
    public void withdraw(double amount) {
        if (amount > 0 && amount <= balance) {
            balance -= amount;
        }
    }
}
```

```

    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < n; i++) {
            int accountNumber = Integer.parseInt(sc.nextLine());
            String customerName = sc.nextLine();
            double initialBalance = Double.parseDouble(sc.nextLine());
            double depositAmount = Double.parseDouble(sc.nextLine());
            double withdrawalAmount = Double.parseDouble(sc.nextLine());
            BankAccount account = new BankAccount(accountNumber,
            customerName, initialBalance);
            account.deposit(depositAmount);
            account.withdraw(withdrawalAmount);
            System.out.println("Account Number: " + account.getAccountNumber());
            System.out.println("Customer Name: " + account.getCustomerName());
            System.out.println("Final Balance: " + String.format("%.1f",
            account.getBalance()));
        }
        sc.close();
    }
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 4_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a secure banking system, customers are required to create PIN codes for accessing their accounts. The bank wants to validate these PIN codes before accepting them.

A PIN code is considered valid if:

It consists of exactly 4 digits. All characters must be numeric (0–9). It cannot contain all identical digits (e.g., 1111 is invalid).

Your task is to determine whether each PIN code in the list is valid or not.

Input Format

The first line of input contains an integer T, representing the number of PIN codes to check.

The next T lines each contain a string S, representing a PIN code.

Output Format

For each PIN code S, the output print "YES" if it is valid.

Otherwise, the output print "NO".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

1234

Output: YES

Answer

```
import java.util.Scanner;

class PinValidator {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int T = sc.nextInt();
        sc.nextLine();

        for (int i = 0; i < T; i++) {
            String pin = sc.nextLine().trim();
            if (isValidPIN(pin)) {
                System.out.println("YES");
            } else {
                System.out.println("NO");
            }
        }

        sc.close();
    }

    private static boolean isValidPIN(String pin) {
        if (pin.length() != 4) return false;
```



```
for (char c : pin.toCharArray()) {  
    if (!Character.isDigit(c)) return false;  
}  
  
char first = pin.charAt(0);  
boolean allSame = true;  
for (int i = 1; i < pin.length(); i++) {  
    if (pin.charAt(i) != first) {  
        allSame = false;  
        break;  
    }  
}  
return !allSame;  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 4_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Bechan Chacha is seeking help to filter out valid mobile numbers from a list provided by his crush. He can only pick his crush's number if the list contains valid mobile numbers.

A mobile number is considered valid if:

It has exactly 10 digits. It consists only of numeric values (0–9). It does not begin with zero.

Your task is to determine whether each mobile number in the list is valid or not.

Input Format

The first line contains an integer T, representing the number of mobile numbers

to check.

The next T lines each contain a string S, representing a mobile number.

Output Format

For each mobile number S, the output print "YES" if it is valid.

Otherwise, print "NO".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
9876543210
Output: YES

Answer

```
import java.util.*;
```

```
class MobileNumberValidator {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        int T = sc.nextInt();  
        sc.nextLine();  
  
        for (int i = 0; i < T; i++) {  
            String number = sc.nextLine().trim();  
            if (isValidMobile(number)) {  
                System.out.println("YES");  
            } else {  
                System.out.println("NO");  
            }  
        }  
  
        sc.close();  
    }  
}
```

```
private static boolean isValidMobile(String number) {
```

```
    if (number.length() != 10) return false;

    for (char c : number.toCharArray()) {
        if (!Character.isDigit(c)) return false;
    }

    if (number.charAt(0) == '0') return false;

    return true;
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 4_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Arjun is learning how to filter words from a sentence based on grammar rules. He wants to identify the valid words in a sentence.

A word is considered valid if it satisfies all these conditions:

The word contains only alphabets (a-z, A-Z). The word length is at least 2 characters. The word should not contain digits or special characters.

Your task is to read a sentence and print all the valid words in it.

Input Format

The input contains a single line containing a sentence S.

Output Format

The output prints all the valid words separated by spaces.

If no valid word exists, print "No valid words."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Hello world1 123 ab" @#\$ Hi

Output: Hello Hi

Answer

```
import java.util.*;

class ValidWordsFilter {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String sentence = sc.nextLine();
        sc.close();

        String[] words = sentence.split(" ");
        List<String> validWords = new ArrayList<>();

        for (String word : words) {
            if (isValidWord(word)) {
                validWords.add(word);
            }
        }

        if (validWords.isEmpty()) {
            System.out.println("No valid words.");
        } else {
            System.out.println(String.join(" ", validWords));
        }
    }

    private static boolean isValidWord(String word) {
        if (word.length() < 2) return false;

        for (char c : word.toCharArray()) {
```

```
        if (!Character.isLetter(c)) return false;
    }
    return true;
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 4_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 6.5

Section 1 : Coding

1. Problem Statement

Anu is developing a tool for a conference registration system. Participants submit keywords related to their fields of interest. The organizer wants to sort these keywords alphabetically to generate tags for session grouping.

Write a program that accepts at least five keywords as input arguments and outputs them in sorted alphabetical order.

Input Format

The first line of input contains an integer n , representing the number of keywords.

The second line of input contains n space-separated keywords (string).

Output Format

The output prints n space separated strings representing the sorted keyword in alphabetical order.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

Blockchain Cloud AI Data Cybersecurity

Output: AI Blockchain Cloud Cybersecurity Data

Answer

```
import java.util.*;

class KeywordSorter {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();
        sc.nextLine();

        String[] keywords = sc.nextLine().split(" ");

        Arrays.sort(keywords, String.CASE_INSENSITIVE_ORDER);

        for (int i = 0; i < keywords.length; i++) {
            System.out.print(keywords[i]);
            if (i != keywords.length - 1) {
                System.out.print(" ");
            }
        }

        sc.close();
    }
}
```

Status: Partially correct

Marks : 6.5/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 4_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a publishing company, editors often need to quickly analyze passages of text to check for punctuation usage. To assist them, you are asked to write a program that counts the number of specific punctuation marks in each passage.

The punctuation marks of interest are:

Commas (,) Periods (.) Question marks (?)

Input Format

The first line of input contains an integer T, representing the number of test cases (passages).

Each of the next T lines contains a single passage of text.

Output Format

For each test case, print three integers separated by spaces, representing the number of commas, periods, and question marks in the passage.

The first line of output corresponds to the first passage, the second line to the second passage, and so on.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1

Hello, world. How are you?

Output: 1 1 1

Answer

```
import java.util.*;
```

```
class PunctuationCounter {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int T = Integer.parseInt(sc.nextLine()); // number of test cases
        for (int i = 0; i < T; i++) {
            String passage = sc.nextLine();
            int commas = 0, periods = 0, questions = 0;

            for (char c : passage.toCharArray()) {
                if (c == ',') commas++;
                else if (c == '.') periods++;
                else if (c == '?') questions++;
            }

            System.out.println(commas + " " + periods + " " + questions);
        }
        sc.close();
    }
}
```

}

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 13

Section 1 : MCQ

1. What will be the output of the following code?

```
public class Main {  
    public static void main(String[] args) {  
        int i = 10;  
        do {  
            System.out.print(i + " ");  
            i -= 3;  
        } while(i > 0);  
    }  
}
```

Answer

10 7 4 1

Status : Correct

Marks : 1/1

2. What will be the output of the following code?

```
class LoopTest {  
    public static void main(String[] args) {  
        int i = 1;  
        do {  
            System.out.print(i + " ");  
            i *= 2;  
        } while (i <= 8);  
    }  
}
```

Answer

1 2 4 8

Status : Correct

Marks : 1/1

3. What will be the output of the following code?

```
class Test {  
    public static void main(String[] args) {  
        int a = 4, b = 5;  
        if ((a + b) % 2 == 0)  
            System.out.print("Even");  
        else  
            System.out.print("Odd");  
    }  
}
```

Answer

Odd

Status : Correct

Marks : 1/1

4. What will be the output of the following code?

```
class Main {  
    public static void main(String[] args) {  
        for (int i = 5; i > 0; i--) {
```

```
        System.out.print(i + " ");
    }
}
}
```

Answer

5 4 3 2 1

Status : Correct

Marks : 1/1

5. What will be the output of the following Java code snippet?

```
public class Main {
    public static void main(String[] args) {
        int day = 4;
        String result = "";
        switch(day) {
            case 1:
                result = "Monday";
                break;
            case 2:
                result = "Tuesday";
                break;
            case 3:
                result = "Wednesday";
                break;
            default:
                result = "Other Day";
        }
        System.out.println(result);
    }
}
```

Answer

Other Day

Status : Correct

Marks : 1/1

6. What will be the output of the following code?

```
class ConditionTest {  
    public static void main(String[] args) {  
        int x = 10;  
        if (x > 5)  
            System.out.print("High");  
    }  
}
```

Answer

High

Status : Correct

Marks : 1/1

7. What will be the output of the following code?

```
class LoopTest {  
    public static void main(String[] args) {  
        int i = 1;  
        while (i > 0) {  
            System.out.print(i + " ");  
            i++;  
            if (i == 5) break;  
        }  
    }  
}
```

Answer

1 2 3 4

Status : Correct

Marks : 1/1

8. What will be the output of the following code?

```
public class Main {  
    public static void main(String[] args) {  
        for(int i = 1; i <= 20; i = i * 2) {  
            System.out.print(i + " ");  
        }  
    }  
}
```


Answer

1 2 4 8 16

Status : Correct

Marks : 1/1

9. What will be the output of the following code?

```
class Test {  
    public static void main(String[] args) {  
        int num = 15;  
        if (num > 10)  
            if (num % 3 == 0)  
                System.out.print("Divisible");  
            else  
                System.out.print("Not Divisible");  
        }  
    }  
}
```

Answer

Divisible

Status : Correct

Marks : 1/1

10. What will be the output of the following code?

```
class ConditionTest {  
    public static void main(String[] args) {  
        int a = 7;  
        if (a == 7)  
            System.out.print("Match");  
        else  
            System.out.print("No Match");  
    }  
}
```

Answer

Match

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
class Test {  
    public static void main(String[] args) {  
        int x = 5, y = 2;  
        if (x + y == 10)  
            System.out.print("Ten");  
        else if (x - y == 3)  
            System.out.print("Three");  
        else  
            System.out.print("None");  
    }  
}
```

Answer

None

Status : Wrong

Marks : 0/1

12. What will be the output of the following code?

```
public class Main {  
    public static void main(String[] args) {  
        int sum = 0;  
        for(int i = 1; i <= 5; i++) {  
            sum += i;  
        }  
        System.out.println(sum);  
    }  
}
```

Answer

15

Status : Correct

Marks : 1/1

13. What will be the output of the following Java code snippet?

```
public class Main {  
    public static void main(String[] args) {  
        int score = 75;  
        if(score >= 90) {  
            System.out.println("Grade: A");  
        } else if(score >= 80) {  
            System.out.println("Grade: B");  
        } else if(score >= 70) {  
            System.out.println("Grade: C");  
        } else {  
            System.out.println("Grade: D");  
        }  
    }  
}
```

Answer

Grade: C

Status : Correct

Marks : 1/1

14. What will be the output of the following code?

```
public class Main {  
    public static void main(String[] args) {  
        int i = 1;  
        while(i < 10) {  
            i += 2;  
        }  
        System.out.println(i);  
    }  
}
```

Answer

11

Status : Correct

Marks : 1/1

15. What will be the output of the following code?

```
class Loop {  
    public static void main(String[] args) {  
        for (int i = 1; i <= 3; i++) {  
            for (int j = 1; j <= 2; j++) {  
                System.out.print(i + "" + j + " ");  
            }  
        }  
    }  
}
```

Answer

11 12 21 22

Status : Wrong

Marks : 0/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q8

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

A bank generates secure codes using 3-digit numbers where each digit is unique, and the code must be divisible by 3. You are tasked with generating the first N such codes based on user input, ensuring the digits are unique and the number is divisible by 3.

Note: Use nested for loops to solve.

Input Format

The first line contains an integer N representing the number of valid codes to generate.

Output Format

The output prints N lines, each line contains a valid 3-digit code.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

Output: 102

105

108

120

123

Answer

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);
```

```
  
        int N = sc.nextInt(); // Number of valid codes to generate  
        int count = 0;        // Count of codes generated
```

```
  
        // Use nested for loops to generate 3-digit numbers with unique digits  
        for (int i = 1; i <= 9; i++) { // Hundreds place: 1 to 9 (cannot be 0)  
            for (int j = 0; j <= 9; j++) { // Tens place: 0 to 9  
                if (j == i) continue; // Digits must be unique  
                for (int k = 0; k <= 9; k++) { // Units place: 0 to 9  
                    if (k == i || k == j) continue;
```

```
  
                int num = i * 100 + j * 10 + k;
```

```
  
                if (num % 3 == 0) { // Check divisibility by 3  
                    System.out.print(num + " ");  
                    count++;
```

```
  
                if (count == N) {  
                    break; // Stop after printing N valid codes
```

```
                }  
            }  
        }  
    }
```

```
        if (count == N) break;
    }
    if (count == N) break;
}
    sc.close();
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q7

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are taking part in a coding challenge where your task is to design a program that conjures a mesmerizing numerical pyramid pattern. The enchanting pattern is fashioned using a for loop and is customized based on user input.

Participants are prompted to unveil the pyramid's magic by specifying its height - essentially dictating the number of rows in this spellbinding creation.

Write a program that employs to weave this captivating numerical pyramid as shown below.

Example

Input:

4

Output:

Input Format

The input consists of a positive integer n representing the number of rows in the pattern.

Output Format

The output prints the required pyramid pattern, as shown in the sample output.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

Output: 1

123

12345

1234567

Answer

```
// You are using Java
import java.util.Scanner;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
```

```
        int n = sc.nextInt(); // Number of rows
```

```
        for (int i = 1; i <= n; i++) {
            // Print spaces
            for (int s = 1; s <= n - i; s++) {
                System.out.print(" ");
            }
        }
```

```
// Print numbers from 1 to (2*i - 1)
for (int num = 1; num <= 2 * i - 1; num++) {
    System.out.print(num);
}

// Add space between pyramid levels (no newline)
System.out.print(" ");
}

sc.close();
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q6

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Maya, a student in an arts and crafts class, wants to create a pattern using stars (*) in a specific format. She plans to use a program to help her construct the pattern.

Write a program that takes an integer as input and constructs the following pattern using nested for loops.

Input: 5

Output:

*

* *

```
* * *
* * * *
* * * * *
* * * *
* * * *
* * *
* *
*
*
```

Input Format

The input consists of a number (integer) representing the number of rows.

Output Format

The output displays the required pattern.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5

Output: *

```
* *
* * *
* * * *
* * * * *
* * * *
* * * *
* * *
* *
*
*
```

Answer

```
// You are using Java
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
```

```
Scanner sc = new Scanner(System.in);

// Read input
int rows = sc.nextInt();

// Upper part of the pattern (increasing)
for (int i = 1; i <= rows; i++) {
    for (int j = 1; j <= i; j++) {
        System.out.print("* ");
    }
}

// Lower part of the pattern (decreasing)
for (int i = rows - 1; i >= 1; i--) {
    for (int j = 1; j <= i; j++) {
        System.out.print("* ");
    }
}

sc.close();
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ted, the computer science enthusiast, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Guide Ted in designing and writing the code to solve this problem using a 'do-while' loop.

Input Format

The input consists of an integer N, representing the number to be checked.

Output Format

If the sum is equal to the number of digits, print "The number of digits in N matches the sum of its digits."

Else, print "The number of digits in N does not match the sum of its digits."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20

Output: The number of digits in 20 matches the sum of its digits.

Answer

```
// You are using Java
import java.util.Scanner;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
```

```
        // Read input number N
        int N = sc.nextInt();
```

```
        int temp = N;
        int sum = 0;
        int count = 0;
```

```
        // Use do-while loop to calculate sum of digits and number of digits
        do {
            int digit = temp % 10;
            sum += digit;
            count++;
            temp /= 10;
        } while (temp > 0);
```

```
        // Check if sum of digits equals number of digits
        if (sum == count) {
            System.out.println("The number of digits in " + N + " matches the sum of
its digits.");
        } else {
            System.out.println("The number of digits in " + N + " does not match the
sum of its digits.");
        }
    }
}
```

```
}  
    sc.close();  
}  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Amit wants to evaluate the depreciation of his car over time to understand its current value and categorize it based on that value.

Write a program that helps him determine the current value of his car after a certain number of years of depreciation and classify it into one of three categories:

High: If the current value is greater than 10,000. Medium: If the current value is between 5,000 and 10,000, both inclusive. Low: If the current value is less than 5,000.

The depreciation rate of the car is 15% per year. The program should calculate the current value of the car after applying this depreciation over the given number of years and print the current value along with the category.

Input Format

The first line of input consists of an integer, representing the initial cost of the car.

The second line consists of an integer, representing the number of years the car has been depreciating.

Output Format

The first line of output prints a double value, representing the current value of the car, rounded off to two decimal places "Current Value: <value>".

The second line prints its category "Category: <categories>".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20000
5

Output: Current Value: 8874.11
Category: Medium

Answer

```
import java.util.*;
class amount{
    public double val(double amt,int year){
        for(int i=0;i<year;i++){
            double deduction=0.15*amt;
            amt=amt-deduction;
        }
        return amt;
    }
    public String classify(double b){
        if(b>10000){
            return "High";
        }
        else if(b>=5000 && b<=10000){
            return "Medium";
        }
    }
}
```

```
        else{
            return "Low";
        }
    }
}

public class Main{
    public static void main(String args[]){
        Scanner sc=new Scanner(System.in);
        double amt=sc.nextInt();
        int year=sc.nextInt();
        amount obj=new amount();
        double d= obj.val(amt,year);
        String cat=obj.classify(d);

        System.out.printf("Current Value: %.2f\n",d);
        System.out.println("Category: "+cat);
        sc.close();
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

John is a fitness trainer, and he wants to use the BMI calculator to assess the body mass index of his clients. He has a list of clients based on their height and weight.

John plans to write a program to quickly determine the BMI and provide a classification for each client.

If BMI is less than 18.5, the program will classify it as "Underweight" If BMI is between 18.6 and 24.9, the program will classify it as "Normal Weight" If BMI is between 25.0 and 29.9, the program will classify it as "Overweight" If BMI is 30.0 or higher, the program will classify it as "Obese"

Note: Formula to calculate BMI = $\text{weight}/(\text{height}*\text{height})$

Input Format

The first line of input consists of a double value, representing the height of the person in meters.

The second line consists of a double value, representing the weight of the person in kilograms.

Output Format

The first line of output prints "BMI: " followed by a double (rounded to two decimal places) representing the calculated BMI.

The second line prints "Classification: " followed by a string indicating the BMI category (Underweight, Normal Weight, Overweight, or Obese).

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1.2

45.2

Output: BMI: 31.39

Classification: Obese

Answer

```
import java.util.*;
class BMI{
    private double height;
    private double weight;

    public BMI(double height,double weight){
        this.height=height;
        this.weight=weight;
    }

    public double calcbmi(){
        return weight/(height*height);
    }

    public String classifybmi(){
        double bmi=calcbmi();
        if(bmi<18.5){
```

```

        return "Underweight";
    }
    else if(bmi>=18.6 && bmi<=24.9){
        return "Normal Weight";
    }
    else if(bmi>=25.0 && bmi<=29.9){
        return "Overweight";
    }
    else{
        return "Obese";
    }
}
}
}

public class Main{
    public static void main(String args[]){
        Scanner sc=new Scanner(System.in);

        double height=sc.nextDouble();
        double weight=sc.nextDouble();

        BMI bmiObj=new BMI(height,weight);
        double val=bmiObj.calcbmi();
        String cat=bmiObj.classifybmi();

        System.out.printf("BMI: %.2f\n",val);
        System.out.println("Classification: "+cat);
        sc.close();
    }
}
}

```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Samantha is a diligent math student who is exploring the world of programming. She is learning Java and has recently studied conditional statements. One day, her teacher gives her an interesting problem to solve, which takes a number as input and checks whether it is a multiple of 5 or 7.

Help her complete the task.

Input Format

The input consists of a single integer N, representing the number to be checked.

Output Format

If the number is a multiple of 5 but not 7, the output prints "N is a multiple of 5".

If the number is a multiple of 7, the output prints "N is a multiple of 7".

Otherwise the output prints "N is neither multiple of 5 nor 7" where N is an entered integer.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10

Output: 10 is a multiple of 5

Answer

```
import java.util.*;
class main{
    public static void main(String args[]){
        Scanner sc=new Scanner(System.in);
        int a=sc.nextInt();
        if((a%5==0) || (a%7==0)){
            if(a%5==0){
                System.out.println(a+" is a multiple of 5");
            }
            else if(a%7==0){
                System.out.println(a+" is a multiple of 7");
            }
        }
        else{
            System.out.println(a+" is neither multiple of 5 nor 7");
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Arun is working on a project to automate the process of determining whether a student has passed or failed based on their subject marks.

He aims to create a simple program that takes positive integers as marks for five subjects from the user. If the average of the marks is greater than or equal to 50, the student has passed the exam. Otherwise, the student has failed.

Help Arun to implement the project.

Input Format

The input consists of five space-separated integers, representing the marks in five subjects.

Output Format

The first line of output prints "Average score: " followed by an integer representing the average score.

The second line prints one of the following:

1. If the condition is satisfied, print "The student has passed".
2. Otherwise, the output prints "The student has failed".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 50 60 70 80 90

Output: Average score: 70

The student has passed

Answer

```
import java.util.*;
class main{
    public static void main(String args[]){
        Scanner sc=new Scanner(System.in);
        int m1=sc.nextInt();
        int m2=sc.nextInt();
        int m3=sc.nextInt();
        int m4=sc.nextInt();
        int m5=sc.nextInt();
        int sum=m1+m2+m3+m4+m5;
        int avg=sum/5;
        System.out.println("Average score: "+avg);
        if(avg>=50){
            System.out.printf("The student has passed");
        }
        else{
            System.out.printf("The student has failed");
        }
    }
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What will be the output of the following code?

```
import java.util.*;

class TernaryOperatorExample {
    public static void main(String[] args) {
        int a = 5, b = 10;
        int result = (a > b) ? a : b;
        System.out.println(result);
    }
}
```

Answer

10

Status : Correct

Marks : 1/1

2. What is the output of the following code?

```
import java.util.*;

class RelationalOperatorExample {
    public static void main(String[] args) {
        int x = 8, y = 4;
        boolean result = (x != y);

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

Answer

true

Status : Correct

Marks : 1/1

3. What will be the output of the following code snippet?

```
class DivisionExample {
    public static void main(String[] args) {
        double num1 = 10.5;
        double num2 = 3;
        int result = (int)(num1 / num2);
        System.out.println(result);
    }
}
```

Answer

3

Status : Correct

Marks : 1/1

4. What is the output of the following code?

```
class TestClass {
    public static void main(String[] args) {
        int x = 5;
```

```
int X = 10;

int sum = x + X;
int bitwiseResult = x | X;

System.out.println(sum);
System.out.println(bitwiseResult);
}
}
```

Answer

1515

Status : Correct

Marks : 1/1

5. What is the output of the following code?

```
class TestClass {
    public static void main(String[] args) {
        int a = 5;
        int b = 10;

        int sum = a + b;
        int bitwiseAnd = a & b;
        int bitwiseOr = a | b;

        System.out.println(sum);
        System.out.println(bitwiseAnd);
        System.out.println(bitwiseOr);
    }
}
```

Answer

15015

Status : Correct

Marks : 1/1

6. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int count = 8;  
        count = count ^ 1;  
  
        System.out.println(count);  
    }  
}
```

Answer

9

Status : Correct

Marks : 1/1

7. What is the output of the following program?

```
class Demo {  
    public static void main(String[] args) {  
        String text = "Hello, World!";  
        System.out.println(text);  
    }  
}
```

Answer

Hello, World!

Status : Correct

Marks : 1/1

8. What is the output of the following program?

```
class Arithmetic {  
    public static void main(String[] args) {  
        char ch = 'A';  
        System.out.println(ch);  
    }  
}
```

Answer

A

Status : Correct

Marks : 1/1

9. What is the result of the following expression?

```
import java.util.*;

class ComplexExpressionExample {
    public static void main(String[] args) {
        int a = 5, b = 2, c = 3, d = 4;
        int result = a + b * c / d - b;

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

Answer

4

Status : Correct

Marks : 1/1

10. Which of the following data types is used to store single characters?

Answer

char

Status : Correct

Marks : 1/1

11. Which of the following is not a primitive data type?

Answer

string

Status : Correct

Marks : 1/1

12. What is the output of the following code?

```
class TestClass {
```



```
public static void main(String[] args) {  
    int a = 10;  
    int b = 3;  
    System.out.println(a / b);  
}  
}
```

Answer

3

Status : Correct

Marks : 1/1

13. Which of the following data types is used to store floating-point numbers with greater precision?

Answer

double

Status : Correct

Marks : 1/1

14. What will be the output of the following program?

```
class DataTypesMCQ {  
    public static void main(String[] args) {  
        int a = 10;  
        double b = 5;  
        System.out.println(a / b);  
    }  
}
```

Answer

2.0

Status : Correct

Marks : 1/1

15. What will be the output of the following code snippet?

```
import java.util.*;
```

```
class OperatorPrecedenceExample {  
    public static void main(String[] args) {  
        int a = 5, b = 3, c = 2;  
        int result = a + b * c;  
  
        System.out.println(result);  
    }  
}
```

Answer

11

Status : Correct

Marks : 1/1

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 3_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Sesha is developing a weather monitoring system for a region with multiple weather stations. Each weather station collects temperature data hourly and stores it in a 2D array.

Write a program that can add the temperature data from two different weather stations to create a combined temperature record for the region.

Input Format

The first line of input consists of two space-separated integers N and M, representing the number of rows and columns of the matrices, respectively.

The next N lines consist of M space-separated integers, representing the values of the first matrix.

The following N lines consist of M space-separated integers, representing the values of the second matrix.

Output Format

The output prints the addition of the two matrices in N rows and M columns, representing the combined temperature record.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3 3

1 2 3

4 5 6

7 8 9

1 1 1

2 2 2

3 3 3

Output: 2 3 4

6 7 8

10 11 12

Answer

```
import java.util.Scanner;
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);
```

```
  
        int n = scanner.nextInt();  
        int m = scanner.nextInt();
```

```
  
        int[][] array1 = new int[10][10];  
        int[][] array2 = new int[10][10];
```

```
  
        for (int i = 0; i < n; i++) {  
            for (int j = 0; j < m; j++) {  
                array1[i][j] = scanner.nextInt();  
            }  
        }  
    }  
}
```

```
for (int i = 0; i < n; i++) {  
    for (int j = 0; j < m; j++) {  
        array2[i][j] = scanner.nextInt();  
    }  
}  
  
int[][] resultArray = new int[n][m];  
  
for (int i = 0; i < n; i++) {  
    for (int j = 0; j < m; j++) {  
        resultArray[i][j] = array1[i][j] + array2[i][j];  
    }  
}  
  
for (int i = 0; i < n; i++) {  
    for (int j = 0; j < m; j++) {  
        System.out.print(resultArray[i][j] + " ");  
    }  
    System.out.println();  
}  
  
scanner.close();  
}
```

Status : Correct

Marks : 10/10

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 3_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What will be the output of the following code?

```
class ReverseArray {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3, 4};  
        for (int i = 0; i < a.length / 2; i++) {  
            int temp = a[i];  
            a[i] = a[a.length - 1 - i];  
            a[a.length - 1 - i] = temp;  
        }  
        for (int i : a)  
            System.out.print(i + " ");  
    }  
}
```

Answer

4 3 2 1

Status : Correct

Marks : 1/1

2. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[][] a = {  
            {1, 2},  
            {3, 4}  
        };  
        for (int i = 0; i < a.length; i++) {  
            for (int j = 0; j < a[0].length; j++) {  
                System.out.print(a[i][j] + " ");  
            }  
        }  
    }  
}
```

Answer

1 2 3 4

Status : Correct

Marks : 1/1

3. What will be the output of the given code?

```
public class Main {  
    public static void main(String[] args) {  
        int[] arr = {1, 2, 3, 4, 5};  
        int n = arr.length;  
        int temp = arr[0];  
  
        for (int i = 0; i < n - 1; i++) {  
            arr[i] = arr[i + 1];  
        }  
        arr[n - 1] = temp;  
  
        for (int num : arr) {
```

```
        System.out.print(num + " ");
    }
}
}
```

Answer

2 3 4 5 1

Status : Correct

Marks : 1/1

4. What will be the output of the following code?

```
class Q {
    public static void main(String[] args) {
        int[] a = {1, 2, 3, 4};
        for (int i = 0; i < a.length; i++) {
            if (a[i] % 2 == 0)
                a[i] = 0;
        }
        System.out.println(a[1] + " " + a[3]);
    }
}
```

Answer

0 0

Status : Correct

Marks : 1/1

5. What will be the output of the following code?

```
class M {
    public static void main(String[] args) {
        int[][] arr = {
            {1, 2},
            {3, 4},
            {5, 6}
        };

        for (int i = 0; i < arr.length; i++) {
```



```
        System.out.print(arr[i][0] + " ");  
    }  
}
```

Answer

1 3 5

Status : Correct

Marks : 1/1

6. What will be the output of the following code?

```
class Sample {  
    public static void main(String[] args) {  
        int[][] matrix = {  
            {1, 2, 3},  
            {4, 5, 6}  
        };  
        System.out.println(matrix[1][2]);  
    }  
}
```

Answer

6

Status : Correct

Marks : 1/1

7. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[][] arr = {  
            {5, 6, 7},  
            {8, 9, 10}  
        };  
        System.out.println(arr[0][2]);  
    }  
}
```

Answer

7

Status : Correct

Marks : 1/1

8. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[] nums = {3, 6, 7, 2, 8};  
        int sum = 0;  
        for (int i = 0; i < nums.length; i++) {  
            if (nums[i] % 2 == 0)  
                sum += nums[i];  
        }  
        System.out.println(sum);  
    }  
}
```

Answer

16

Status : Correct

Marks : 1/1

9. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[][] a = {  
            {1, 2},  
            {3, 4}  
        };  
        int sum = 0;  
        for (int i = 0; i < a.length; i++)  
            for (int j = 0; j < a[0].length; j++)  
                sum += a[i][j];  
        System.out.println(sum);  
    }  
}
```

```
}
```

Answer

10

Status : Correct

Marks : 1/1

10. What will be the output of the following code?

```
class Sample {  
    public static void main(String[] args) {  
        int[][] data = {  
            {1, 2},  
            {3, 4}  
        };  
        int sum = 0;  
  
        for (int[] row : data) {  
            for (int val : row) {  
                sum += val;  
            }  
        }  
  
        System.out.println("Sum = " + sum);  
    }  
}
```

Answer

Sum = 10

Status : Correct

Marks : 1/1

11. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[] nums = {4, 2, 9, 5};  
        int max = nums[0];  
        for (int i = 1; i < nums.length; i++) {
```

```
        if (nums[i] > max)
            max = nums[i];
    }
    System.out.println(max);
}
}
```

Answer

9

Status : Correct

Marks : 1/1

12. What will be the output of the following code?

```
class Q {
    public static void main(String[] args) {
        int[] a = {1, 2, 1, 3, 1, 4};
        int count = 0;
        for (int i = 0; i < a.length; i++) {
            if (a[i] == 1) count++;
        }
        System.out.println(count);
    }
}
```

Answer

3

Status : Correct

Marks : 1/1

13. What will be the output of the following code?

```
public class Test {
    public static void main(String[] args) {
        int[] x = {4, 8, 12};
        int result = x[0] * x[2];
        System.out.println(result);
    }
}
```

Answer

48

Status : Correct

Marks : 1/1

14. What will be the output of the following code?

```
class Sample {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3};  
        int product = 1;  
        for (int i = 0; i < a.length; i++) {  
            product *= a[i];  
        }  
        System.out.println(product);  
    }  
}
```

Answer

6

Status : Correct

Marks : 1/1

15. What will be the output of the following code?

```
class Q {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3, 4};  
        for (int i = 0; i < a.length / 2; i++) {  
            int temp = a[i];  
            a[i] = a[a.length - 1 - i];  
            a[a.length - 1 - i] = temp;  
        }  
        System.out.println(a[0]);  
    }  
}
```

Answer

4

Status : Correct

Marks : 1/1