Rajalakshmi Engineering College

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_MCQ

Attempt : 3
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 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***

3. 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***

4. 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***

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 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***

9. 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***

10. 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***

11. 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**

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

Answer

string

Status : Correct **Marks : 1/1**

13. 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**

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 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***

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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

```
import java.util.Scanner;

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

        for (int i = 1; i <= n; i++) {
            // Print leading spaces
            for (int j = 1; j <= n - i; j++) {
                System.out.print(" ");
            }

            // Print numbers from 1 to (2*i - 1)
```

```
            for (int k = 1; k <= 2 * i - 1; k++) {
                System.out.print(k);
            }

            // Move to next line
            System.out.println();
        }
    }
}
```

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

```
import java.util.Scanner;

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

```
        int n = scanner.nextInt();

        // Upper pyramid
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        // Lower inverted pyramid
        for (int i = n - 1; i > 0; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        scanner.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.Scanner;

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

        int initialCost = scanner.nextInt();
        int age = scanner.nextInt();

        double currentValue = initialCost * Math.pow(0.85, age);
        double epsilon = 1e-9; // small enough to fix 1842.3749999999998 to
1842.375
        currentValue += epsilon;

        String category;
        if (currentValue > 10000) {
```

```
            category = "High";
        } else if (currentValue <= 10000 && currentValue >= 5000) {
            category = "Medium";
        } else {
            category = "Low";
        }

        System.out.printf("Current Value: %.2f\n" , currentValue);
        System.out.println("Category: " + category);
    }
}
```

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 = weight/(height*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.Scanner;

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

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

        double bmi = weight / (height * height);

        String classification;
        if (bmi < 18.5) {
            classification = "Underweight";
        } else if (bmi >= 18.6 && bmi <= 24.9) {
            classification = "Normal Weight";
        } else if (bmi >= 25.0 && bmi <= 29.9) {
```

```
            classification = "Overweight";
        } else {
            classification = "Obese";
        }

        System.out.printf("BMI: %.2f\n", bmi);
        System.out.println("Classification: " + classification);

        scanner.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.Scanner;

public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      int number = scanner.nextInt();
      if (number % 5 == 0) {
         System.out.println(number + " is a multiple of 5");
      } else if(number % 7 == 0){
         System.out.println(number + " is a multiple of 7");
      }
      else{
         System.out.println(number + " is neither multiple of 5 nor 7");
      }
      scanner.close();
   }
}
```

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.Scanner;

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

      int subject1 = scanner.nextInt();
      int subject2 = scanner.nextInt();
      int subject3 = scanner.nextInt();
      int subject4 = scanner.nextInt();
      int subject5 = scanner.nextInt();

      int totalMarks = subject1 + subject2 + subject3 + subject4 + subject5;

      int averageMarks = totalMarks / 5;

      if (averageMarks >= 50) {
            System.out.println("Average score: "+averageMarks+"\nThe student has
passed");
      } else {
            System.out.println("Average score: "+averageMarks+"\nThe 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 2_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. 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***

2. 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

Three

Status : Correct ***Marks : 1/1***

3. 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***

4. 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***

5. 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***

6. 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***

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?

```
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***

9. 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***

10. 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***

11. 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***

12. 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***

13. 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***

14. 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 31 32

Status : Correct ***Marks : 1/1***

15. 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***

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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

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

public class Main

{


    /**
     * Checks if a single integer meets the specified condition:
     * (number <= 0) AND (number is odd).
     * * @param num The integer to check.
     * @return true if the condition is met, false otherwise.
     */
    public static boolean checkCondition(int num)

{


        // Condition 1: Less than or equal to zero (num <= 0)
        boolean isNonPositive = (num <= 0);

        // Condition 2: Odd (num % 2 != 0).
        // The modulo operator returns the remainder. For odd numbers, the
remainder is always 1 or -1.
        // We check for not equal to zero.
        boolean isOdd = (num % 2 != 0);

        // The condition requires BOTH to be true.
        return isNonPositive && isOdd;
```

```
}
   public static void main(String[] args)

{


      Scanner sc = new Scanner(System.in);

      // Read the two input integers
      // Note: The problem statement says "on separate lines", so nextInt() is used
twice.
      int input1 = sc.nextInt();
      int input2 = sc.nextInt();

      sc.close();

      // Check the condition for each input
      boolean condition1 = checkCondition(input1);
      boolean condition2 = checkCondition(input2);

      // The final result is true if EITHER one meets the condition
      boolean finalResult = condition1 || condition2;

      // Print the final boolean result
      System.out.println(finalResult);


}

}
```

Status : Correct **Marks : 10/10**

Rajalakshmi Engineering College

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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

{


   /**
    * Calculates the value of the lowest N bits of an integer X.
    * This is achieved by creating a mask with the lowest N bits set to 1,
    * and then applying a bitwise AND operation.
    */
   public static void main(String[] args)

{


      Scanner sc = new Scanner(System.in);

      // Read the input integer X
      int X = sc.nextInt();

      // Read the number of lowest bits to extract N
      int N = sc.nextInt();

      sc.close();
```

```
        // 1. Calculate the Mask: (1 << N) - 1
        // (1 << N) creates a value with only the N-th bit set (e.g., if N=4, result is 16).
        // Subtracting 1 sets all bits from 0 up to N-1 to 1 (e.g., 16-1 = 15, which is
binary 1111).

        // Note: The constraints (N <= 20) ensure that 1 << N fits well within a
standard 32-bit int.
        int mask = (1 << N) - 1;

        // 2. Perform the Bitwise AND Operation: X & mask
        // This operation keeps only the bits in X that align with the '1's in the mask,
        // effectively isolating the lowest N bits of X.
        int result = X & mask;

        // Output the final result
        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_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 6

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 * π * r

A = π * 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;
import java.lang.Math;

class Main

{
```

```
    public static void main(String[] args)
{

        // Use try-with-resources to ensure the Scanner is closed automatically and
safely.
        try (Scanner scanner = new Scanner(System.in))
{


            // 1. Read the radius as a double.
            double radius = scanner.nextDouble();

            // Use the Java constant Math.PI for high-precision pi.
            final double PI = Math.PI;

            // 2. Calculate Circumference (C = 2 * π * r)
            double circumference = 2 * PI * radius;

            // 3. Calculate Area (A = π * r^2)
            double area = PI * radius * radius;

            // 4. Display the Circumference, formatted to 2 decimal places, with its
unit.
            // Using printf for direct, easy formatting.
            System.out.printf("Circumference: %.2f meters%n", circumference);

            // 5. Display the Area, formatted to 2 decimal places, with its unit.
            System.out.printf("Area: %.2f square meters%n", area);



} catch (java.util.InputMismatchException e)
{

            // Error handling for non-numeric input.
```

```
        System.err.println("Invalid input: Please enter a single double value for the radius.");

    }


    }

    }
```

Status : Partially correct **Marks : 6/10**

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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;
    }

    // Setter methods
    public void setEnrollmentId(int enrollmentId) { this.enrollmentId =
enrollmentId; }
    public void setStudentName(String studentName) { this.studentName =
studentName; }
    public void setNumberOfSubjects(int numberOfSubjects)
{ this.numberOfSubjects = numberOfSubjects; }

    // Getter methods
    public int getEnrollmentId() { return enrollmentId; }
    public String getStudentName() { return studentName; }
    public int getNumberOfSubjects() { return numberOfSubjects; }

    // Calculate final fee
    public double calculateFinalFee() {
        double registrationFee = 1000;
        double perSubjectFee = 800;
        double totalFee = registrationFee + (numberOfSubjects * perSubjectFee);

        if (numberOfSubjects > 5) {
            totalFee *= 0.8;  // 20% discount
        }
        return totalFee;
    }
}

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

        int N = Integer.parseInt(sc.nextLine());
        Student[] students = new Student[N];
```

```
        for (int i = 0; i < N; i++) {
            int enrollmentId = Integer.parseInt(sc.nextLine());
            String studentName = sc.nextLine();
            int numberOfSubjects = Integer.parseInt(sc.nextLine());

            students[i] = new Student(enrollmentId, studentName,
numberOfSubjects);
        }

        for (Student student : students) {
            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 to represent a booking
```

```
class Booking {
    private int bookingID;
    private String customerName;
    private double distanceTravelled;

    // Constructor
    public Booking(int bookingID, String customerName, double distanceTravelled)
{
        this.bookingID = bookingID;
        this.customerName = customerName;
        this.distanceTravelled = distanceTravelled;
    }

    // Setter methods
    public void setBookingID(int bookingID) {
        this.bookingID = bookingID;
    }

    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }

    public void setDistanceTravelled(double distanceTravelled) {
        this.distanceTravelled = distanceTravelled;
    }

    // Getter methods
    public int getBookingID() {
        return bookingID;
    }

    public String getCustomerName() {
        return customerName;
    }

    public double getDistanceTravelled() {
        return distanceTravelled;
    }

    // Method to calculate fare
    public double calculateFare() {
        double baseFare = 50.0;
```

```
        double perKmCharge = 10.0;
        double totalFare = baseFare + (distanceTravelled * perKmCharge);

        if (distanceTravelled > 20) {
            totalFare = totalFare * 0.9; // 10% discount
        }

        return totalFare;
    }
}

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

        int N = Integer.parseInt(sc.nextLine()); // Number of bookings

        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);

            double finalFare = booking.calculateFare();

            System.out.println("Booking ID: " + booking.getBookingID());
            System.out.println("Customer Name: " + booking.getCustomerName());
            System.out.printf("Final Fare: %.1f\n", finalFare);
        }

        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 unitFor the next 100 units (101–200) 7 units charge per unitFor units above 200 10 units charge per unitIf 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.*;
```

```
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 int getCustomerId() { return customerId; }
    public String getCustomerName() { return customerName; }
    public double getUnitsConsumed() { return unitsConsumed; }

    public double calculateBill() {
        double bill = 0.0;
        double units = this.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 *= 0.95; // Apply 5% discount
        }

        return bill;
    }
}

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

        int N = Integer.parseInt(sc.nextLine().trim()); // read number of customers
```

```
        for (int i = 0; i < N; i++) {
            int id = Integer.parseInt(sc.nextLine().trim());      // read customer ID
            String name = sc.nextLine().trim();                   // read customer name
            double units = Double.parseDouble(sc.nextLine().trim());// read units
consumed

            Customer customer = new Customer(id, name, units);
            double finalBill = customer.calculateBill();

            System.out.printf("Customer ID: %d\n", customer.getCustomerId());
            System.out.printf("Customer Name: %s\n",
customer.getCustomerName());
            System.out.printf("Final Bill: %.1f\n", finalBill);
        }

        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_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.*;

class Account {
    private int accountNumber;
    private String customerName;
    private double balance;

    // Constructor
    public Account(int accountNumber, String customerName, double
initialBalance) {
        this.accountNumber = accountNumber;
        this.customerName = customerName;
        this.balance = initialBalance;
    }

    // Deposit method
    public void deposit(double amount) {
        if (amount > 0) {
            balance += amount;
        }
    }

    // Withdraw method
    public void withdraw(double amount) {
        if (amount > 0 && amount <= balance) {
            balance -= amount;
        }
    }

    // Getters
    public int getAccountNumber() {
        return accountNumber;
    }

    public String getCustomerName() {
        return customerName;
    }

    public double getBalance() {
```

```
        return balance;
    }
}

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

        Account[] customers = new Account[N];

        for (int i = 0; i < N; i++) {
            int accountNumber = sc.nextInt();
            sc.nextLine(); // consume newline after int
            String customerName = sc.nextLine();
            double initialBalance = sc.nextDouble();
            double depositAmount = sc.nextDouble();
            double withdrawAmount = sc.nextDouble();

            Account acc = new Account(accountNumber, customerName,
initialBalance);
            acc.deposit(depositAmount);
            acc.withdraw(withdrawAmount);

            customers[i] = acc;
        }

        for (Account acc : customers) {
            System.out.println("Account Number: " + acc.getAccountNumber() +
                               " Customer Name: " + acc.getCustomerName() +
                               " Final Balance: " + String.format("%.1f", acc.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 5_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. 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***

2. 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***

3. 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***

4. 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***

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 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***

7. 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***

8. 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

30

Status : Correct ***Marks : 1/1***

9. 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***

10. 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***

11. 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***

12. 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***

13. 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***

14. 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

30

Status : Correct ***Marks : 1/1***

15. 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***

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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 Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int T = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < T; i++) {
            String s = sc.nextLine();
            if (s.matches("^[0-9]{4}$") && !(s.chars().allMatch(ch -> ch ==
s.charAt(0)))) {
                System.out.println("YES");
            } else {
                System.out.println("NO");
            }
        }
        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_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 Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String sentence = sc.nextLine();
        String[] words = sentence.split(" ");
        StringBuilder sb = new StringBuilder();
        for(String w : words){
            if(w.matches("[a-zA-Z]{2,}")){
                if(sb.length() > 0) sb.append(" ");
                sb.append(w);
            }
        }
        if(sb.length() == 0) System.out.println("No valid words.");
        else System.out.println(sb.toString());
    }
}
```

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.Scanner;

class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int T = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < T; i++) {
            String s = sc.nextLine();
            if (s.matches("^[1-9][0-9]{9}$")) {
                System.out.println("YES");
            } else {
                System.out.println("NO");
            }
        }
        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_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

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.*;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int n = scanner.nextInt();
        scanner.nextLine();
        String[] keywords = scanner.nextLine().split(" ");
        Arrays.sort(keywords);
        for (int i = 0; i < n; i++) {
            System.out.print(keywords[i]);
            if (i != n - 1) {
                System.out.print(" ");
            }
        }
        scanner.close();
    }
}
```

Status : Correct ***Marks : 10/10***

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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.Scanner;

class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int T = Integer.parseInt(sc.nextLine());
        for (int i = 0; i < T; i++) {
            String line = sc.nextLine();
            int commas = 0, periods = 0, questions = 0;
            for (char ch : line.toCharArray()) {
                if (ch == ',') commas++;
                else if (ch == '.') periods++;
                else if (ch == '?') 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

REC_2028_OOPS using Java_Week 4_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

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?

```
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***

3. 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***

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. 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 = HellocharAt(1) before = ebuffer after = HicharAt(1) after = i

Status : Correct ***Marks : 1/1***

6. 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***

7. 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 equals1 and s3 equal

Status : Correct ***Marks : 1/1***

8. 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***

9. 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 = Hellolength = 5capacity = 21

Status : Correct ***Marks : 1/1***

10. 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***

11. 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

appleappleapple

Status : Correct ***Marks : 1/1***

12. 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***

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. 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***

15. 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***

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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

2028_REC_OOPS using Java_Week 3_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are developing a warehouse management system for a shipping company. The system uses an integer array to represent the weights of packages in a specific order. To verify that the weight capacity is not exceeded, the program needs to calculate the sum of the weights of the first and last packages in the list.

Task:

Write a code to calculate the sum of the weights of the first and last packages in the list. The program should take an integer array as input and return the total weight of the first and last packages.

Input Format

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

The second line of the input is N space-separated integer values.

Output Format

The output is displayed in the following format:

"Sum of the first and last elements: <<Sum>>"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
10 20 30 40 50
Output: Sum of the first and last elements: 60

Answer

```
import java.util.Scanner;

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

      int size = scanner.nextInt();


      int[] arr = new int[size];
      if (size < 2) {

         return;
      }

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

      int sum = arr[0] + arr[size - 1];

      System.out.println("Sum of the first and last elements: " + sum);
         scanner.close();
```

```
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 3_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Monica is interested in finding a treasure but the key to opening is to get the sum of the main diagonal elements and secondary diagonal elements.

Write a program to help Monica find the diagonal sum of a square 2D array.

Note: The main diagonal of the array consists of the elements traversing from the top-left corner to the bottom-right corner. The secondary diagonal includes elements from the top-right corner to the bottom-left corner.

Input Format

The first line of input consists of an integer N, representing the number of rows and columns.

The following N lines consist of N space-separated integers, representing the 2D array elements.

Output Format

The first line of output prints "Sum of the main diagonal: " followed by an integer, representing the sum of the main diagonal.

The second line prints "Sum of the secondary diagonal: " followed by an integer, representing the sum of the secondary diagonal.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
1 2 3
4 5 6
7 8 9

Output: Sum of the main diagonal: 15
Sum of the secondary diagonal: 15

Answer

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

        int size = scanner.nextInt();

        int[][] arr = new int[size][size];

        for (int i = 0; i < size; i++) {
            for (int j = 0; j < size; j++) {
                arr[i][j] = scanner.nextInt();
            }
        }

        int sum = 0;
        for (int i = 0; i < arr.length; i++) {
            sum += arr[i][i];
```

```
        }

        int sum1 = 0;
        for (int i = 0; i < arr.length; i++) {
            sum1 += arr[i][arr.length - 1 - i];
        }

        System.out.println("Sum of the main diagonal: " + sum);
        System.out.println("Sum of the secondary diagonal: " + sum1);

        scanner.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

```
import java.util.Scanner;

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

```
        int n = scanner.nextInt();

        // Upper pyramid
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        // Lower inverted pyramid
        for (int i = n - 1; i > 0; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        scanner.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.Scanner;

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

        int initialCost = scanner.nextInt();
        int age = scanner.nextInt();

        double currentValue = initialCost * Math.pow(0.85, age);
        double epsilon = 1e-9; // small enough to fix 1842.3749999999998 to
1842.375
        currentValue += epsilon;

        String category;
        if (currentValue > 10000) {
```

```
            category = "High";
        } else if (currentValue <= 10000 && currentValue >= 5000) {
            category = "Medium";
        } else {
            category = "Low";
        }

        System.out.printf("Current Value: %.2f\n" , currentValue);
        System.out.println("Category: " + category);
    }
}
```

Status : Correct **Marks : 10/10**

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Scan to verify results

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 = weight/(height*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.Scanner;

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

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

        double bmi = weight / (height * height);

        String classification;
        if (bmi < 18.5) {
            classification = "Underweight";
        } else if (bmi >= 18.6 && bmi <= 24.9) {
            classification = "Normal Weight";
        } else if (bmi >= 25.0 && bmi <= 29.9) {
```

```
            classification = "Overweight";
        } else {
            classification = "Obese";
        }

        System.out.printf("BMI: %.2f\n", bmi);
        System.out.println("Classification: " + classification);

        scanner.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.Scanner;

public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      int number = scanner.nextInt();
      if (number % 5 == 0) {
         System.out.println(number + " is a multiple of 5");
      } else if(number % 7 == 0){
         System.out.println(number + " is a multiple of 7");
      }
      else{
         System.out.println(number + " is neither multiple of 5 nor 7");
      }
      scanner.close();
   }
}
```

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.Scanner;

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

      int subject1 = scanner.nextInt();
      int subject2 = scanner.nextInt();
      int subject3 = scanner.nextInt();
      int subject4 = scanner.nextInt();
      int subject5 = scanner.nextInt();

      int totalMarks = subject1 + subject2 + subject3 + subject4 + subject5;

      int averageMarks = totalMarks / 5;

      if (averageMarks >= 50) {
            System.out.println("Average score: "+averageMarks+"\nThe student has
passed");
      } else {
            System.out.println("Average score: "+averageMarks+"\nThe 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 2_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. 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***

2. 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

Three

Status : Correct ***Marks : 1/1***

3. 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***

4. 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***

5. 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***

6. 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***

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?

```
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***

9. 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***

10. 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***

11. 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***

12. 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***

13. 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***

14. 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 31 32

Status : Correct ***Marks : 1/1***

15. 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***

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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

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

public class Main

{


    /**
     * Checks if a single integer meets the specified condition:
     * (number <= 0) AND (number is odd).
     * * @param num The integer to check.
     * @return true if the condition is met, false otherwise.
     */
    public static boolean checkCondition(int num)

{


        // Condition 1: Less than or equal to zero (num <= 0)
        boolean isNonPositive = (num <= 0);

        // Condition 2: Odd (num % 2 != 0).
        // The modulo operator returns the remainder. For odd numbers, the
remainder is always 1 or -1.
        // We check for not equal to zero.
        boolean isOdd = (num % 2 != 0);

        // The condition requires BOTH to be true.
        return isNonPositive && isOdd;
```

```
}
   public static void main(String[] args)

{


      Scanner sc = new Scanner(System.in);

      // Read the two input integers
      // Note: The problem statement says "on separate lines", so nextInt() is used
twice.
      int input1 = sc.nextInt();
      int input2 = sc.nextInt();

      sc.close();

      // Check the condition for each input
      boolean condition1 = checkCondition(input1);
      boolean condition2 = checkCondition(input2);

      // The final result is true if EITHER one meets the condition
      boolean finalResult = condition1 || condition2;

      // Print the final boolean result
      System.out.println(finalResult);


}

}
```

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

{


   /**
    * Calculates the value of the lowest N bits of an integer X.
    * This is achieved by creating a mask with the lowest N bits set to 1,
    * and then applying a bitwise AND operation.
    */
   public static void main(String[] args)

{


      Scanner sc = new Scanner(System.in);

      // Read the input integer X
      int X = sc.nextInt();

      // Read the number of lowest bits to extract N
      int N = sc.nextInt();

      sc.close();
```

```
        // 1. Calculate the Mask: (1 << N) - 1
        // (1 << N) creates a value with only the N-th bit set (e.g., if N=4, result is 16).
        // Subtracting 1 sets all bits from 0 up to N-1 to 1 (e.g., 16-1 = 15, which is
binary 1111).

        // Note: The constraints (N <= 20) ensure that 1 << N fits well within a
standard 32-bit int.
        int mask = (1 << N) - 1;

        // 2. Perform the Bitwise AND Operation: X & mask
        // This operation keeps only the bits in X that align with the '1's in the mask,
        // effectively isolating the lowest N bits of X.
        int result = X & mask;

        // Output the final result
        System.out.println("Result: " + result);


}

}
```

Status : Correct **Marks : 10/10**

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Scan to verify results

2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 6

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 * π * r

A = π * 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;
import java.lang.Math;

class Main

{
```

```
    public static void main(String[] args)
{

        // Use try-with-resources to ensure the Scanner is closed automatically and
safely.
        try (Scanner scanner = new Scanner(System.in))
{


            // 1. Read the radius as a double.
            double radius = scanner.nextDouble();

            // Use the Java constant Math.PI for high-precision pi.
            final double PI = Math.PI;

            // 2. Calculate Circumference (C = 2 * π * r)
            double circumference = 2 * PI * radius;

            // 3. Calculate Area (A = π * r^2)
            double area = PI * radius * radius;

            // 4. Display the Circumference, formatted to 2 decimal places, with its
unit.
            // Using printf for direct, easy formatting.
            System.out.printf("Circumference: %.2f meters%n", circumference);

            // 5. Display the Area, formatted to 2 decimal places, with its unit.
            System.out.printf("Area: %.2f square meters%n", area);



} catch (java.util.InputMismatchException e)
{

            // Error handling for non-numeric input.
```

```
        System.err.println("Invalid input: Please enter a single double value for the radius.");

    }


    }

    }
```

Status : Partially correct **Marks : 6/10**

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Scan to verify results

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;

// FIX APPLIED: Removed the 'public' keyword so the class name
// no longer needs to match the file name (Main.java).
class DataConversion

{


   public static void main(String[] args)

{


      // Create a Scanner object for reading input from the console
      Scanner scanner = new Scanner(System.in);

      try

{


         // 1. Read the integer input
         int originalInteger = scanner.nextInt();

         // 2. Convert the integer to a double
         double convertedDouble = originalInteger;

         // 3. Display the output following the specified format
         System.out.println("Original Integer: " + originalInteger);
```

```
            System.out.println("Converted Double: " + convertedDouble);


        } catch (java.util.InputMismatchException e)

        {


            // Handle case where input is not a valid integer
            System.err.println("Invalid input: Please enter a valid integer.");


        } finally
        {


            // Close the scanner object
            scanner.close();


        }


    }

    }
```

Status : Correct **Marks : 10/10**

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Scan to verify results

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)
{


      // Create a Scanner object for input
      Scanner scanner = new Scanner(System.in);

      try
{


         // Read the first integer
         // System.out.println("Enter the first integer:");
         int firstInteger = scanner.nextInt();

         // Read the second integer
         // System.out.println("Enter the second integer:");
         int secondInteger = scanner.nextInt();

         // Check the condition:
         // The condition is met if:
         // (first is positive AND second is NOT divisible by 3)
         // OR
```

```
        // (second is positive AND first is NOT divisible by 3)

        boolean isConditionMet =
            (firstInteger > 0 && secondInteger % 3 != 0) ||
            (secondInteger > 0 && firstInteger % 3 != 0);

        // Output the result
        if (isConditionMet)

{


            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.");


}


} catch (java.util.InputMismatchException e)

{


        // Handle cases where input is not a valid integer
        System.err.println("Invalid input: Please enter two integers.");


} finally

{
```

```
        // Close the scanner
        scanner.close();

    }


    }

    }
```

Status : Correct **Marks : 10/10**

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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 : 0

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

-

Status : Skipped ***Marks : 0/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_MCQ

Attempt : 3
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 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***

3. 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***

4. 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***

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 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***

9. 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***

10. 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***

11. 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**

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

Answer

string

Status : Correct **Marks : 1/1**

13. 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**

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 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***

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

Answer

throw

Status : Correct ***Marks : 1/1***

2. 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***

3. 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***

4. 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***

5. 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***

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

Answer

Custom exceptions must extend either Exception or RuntimeException

Status : Correct ***Marks : 1/1***

7. 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***

8. 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***

9. 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***

10. 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***

11. How do you create an unchecked custom exception?

Answer

By extending RuntimeException

Status : Correct ***Marks : 1/1***

12. 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***

13. 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***

14. 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***

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

Answer

To create user-defined exceptions for specific scenarios

Status : Correct ***Marks : 1/1***

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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 price × 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 productName, double price, int quantity);
    double calculateTotalValue();
}

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

    public SimpleInventory(int size) {
        products = new Product[size];
        count = 0;
    }

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

    public double calculateTotalValue() {
        double totalValue = 0;
        for (int i = 0; i < count; i++) {
```

```
            totalValue += products[i].getValue();
        }
        return totalValue;
    }

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

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

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

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_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 = weight / (height * 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 -1.0;
        }
        double bmi = weight / (height * height);
        return bmi;
    }
}

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

2028_REC_OOPS using Java_Week 7_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement:

Rajiv is analyzing the energy consumption in his household and wants to calculate the total cost based on the daily energy usage. He is given the rate per unit of electricity and the energy consumed for multiple days. To structure this calculation efficiently, he decides to use an interface-based approach.

Implement an interface CostCalculator with the necessary methods to retrieve energy details and compute the cost. The calculations should be handled in the EnergyConsumptionTracker class, while the EnergyConsumptionApp class should only handle input and output.

Formula

Energy Cost for one day = Energy Consumed per day * Rate Per Unit

Input Format

The first line of input consists of the rate per unit as an 'R' (a double value).

The second line of input consists of the number of days 'N' (an integer).

The third line of input consists of the daily energy consumption values for each day 'D" (double values), separated by space.

Output Format

The first line of the output prints: "Day-wise Energy Cost:"

The next N lines of the output print the day-wise energy costs(double type) and the total energy cost (double type) in Indian Rupees in the following format: "Day [day_number]: Rs. [energy_cost]"

The last line of the output prints: "Total Energy Cost: Rs. [total_cost]"

Note: energy_cost and total_cost are rounded off to two decimal points

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 0.01
3
10.0 20.0 30.0
Output: Day-wise Energy Cost:
Day 1: Rs. 0.10
Day 2: Rs. 0.20
Day 3: Rs. 0.30
Total Energy Cost: Rs. 0.60

Answer

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

```
interface CostCalculator {
    void getEnergyDetails(Scanner scanner);
    void calculateAndDisplayCost();
}

class EnergyConsumptionTracker implements CostCalculator {
    private double ratePerUnit;
    private int numDays;
    private double[] energyConsumptionArray;

    public EnergyConsumptionTracker(double ratePerUnit, int numDays) {
        this.ratePerUnit = ratePerUnit;
        this.numDays = numDays;
        this.energyConsumptionArray = new double[numDays];
    }

    public void getEnergyDetails(Scanner scanner) {
        for (int i = 0; i < numDays; i++) {
            energyConsumptionArray[i] = scanner.nextDouble();
        }
    }

    public void calculateAndDisplayCost() {
        double totalCost = 0;
        System.out.println("Day-wise Energy Cost:");
        for (int i = 0; i < numDays; i++) {
            double energyCost = energyConsumptionArray[i] * ratePerUnit;
            totalCost += energyCost;
            System.out.printf("Day %d: Rs. %.2f\n", i + 1, energyCost);
        }
        System.out.printf("Total Energy Cost: Rs. %.2f\n", totalCost);
    }
}

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

        double ratePerUnit = scanner.nextDouble();
        int numDays = scanner.nextInt();

        CostCalculator tracker = new EnergyConsumptionTracker(ratePerUnit,
numDays);
```

```
        tracker.getEnergyDetails(scanner);
        tracker.calculateAndDisplayCost();

        scanner.close();
    }
}
```

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. 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***

2. 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***

3. 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**

4. 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**

5. 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**

6. 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***

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

Answer

MyInterface.staticMethod();

Status : Correct ***Marks : 1/1***

8. 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***

9. 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***

10. 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***

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

Answer

A class can implement multiple interfaces.

Status : Correct ***Marks : 1/1***

12. 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***

13. Which of the following is the correct way to declare an interface in

Java?

Answer

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

Status : Correct **Marks : 1/1**

14. 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**

15. 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***

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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);
    }


    public double calculateCost() {
        return price;
    }
}

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

    public double calculateCost() {
        // Apply a 10% discount to organic produce items
        return 0.9 * price;
    }
}



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) {
        int taxAmount = (price * taxRate) / 100;
        return price + taxAmount;
```

```
    }

    public static double calculateFinalPrice(double price, double taxRate) {
        double taxAmount = (price * taxRate) / 100;
        return price + taxAmount;
    }
}


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_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 {
    public double monthlyCost;
    public double serviceTax;
    public double extraFeatureCost;
}

class PremiumSubscription extends Subscription {
    public PremiumSubscription(double monthlyCost, double serviceTax, double
extraFeatureCost) {
        this.monthlyCost = monthlyCost;
        this.serviceTax = serviceTax;
        this.extraFeatureCost = extraFeatureCost;
    }

    public double calculateMonthlyCost() {
        double totalCost = monthlyCost + serviceTax + extraFeatureCost;
        return totalCost;
    }
}

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

REC_2028_OOPS using Java_Week 6_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. 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***

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

Answer

class B extends A {}

Status : Correct ***Marks : 1/1***

4. 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***

5. 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***

6. 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***

7. 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***

8. 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 AClass BClass C

Status : Correct ***Marks : 1/1***

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

Answer

extends

Status : Correct ***Marks : 1/1***

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

Answer

The method must have the same name, same parameters, and must be in different classes with an inheritance relationship

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. 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**

13. 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***

14. 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***

15. 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***

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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)
{


      // Create a Scanner object for input
      Scanner scanner = new Scanner(System.in);

      try
{


         // Read the first integer
         // System.out.println("Enter the first integer:");
         int firstInteger = scanner.nextInt();

         // Read the second integer
         // System.out.println("Enter the second integer:");
         int secondInteger = scanner.nextInt();

         // Check the condition:
         // The condition is met if:
         // (first is positive AND second is NOT divisible by 3)
         // OR
```

```
        // (second is positive AND first is NOT divisible by 3)

        boolean isConditionMet =
            (firstInteger > 0 && secondInteger % 3 != 0) ||
            (secondInteger > 0 && firstInteger % 3 != 0);

        // Output the result
        if (isConditionMet)

{


            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.");


}


} catch (java.util.InputMismatchException e)

{


        // Handle cases where input is not a valid integer
        System.err.println("Invalid input: Please enter two integers.");


} finally

{
```

```
        // Close the scanner
        scanner.close();

    }


    }

    }
```

Status : Correct **Marks : 10/10**

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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 : 0

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

-

Status : Skipped ***Marks : 0/10***