Rajalakshmi Engineering College

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Batch: 2028
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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

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

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

Input Format

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

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

Output Format

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

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 90
80
Output: The integer closer to 100 is 90 with a difference of 10

Answer

```
// You are using Java
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 diffN = Math.abs(N - 100);
      int diffM = Math.abs(M - 100);


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

      // 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_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 9

Section 1 : MCQ

1. 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

1

Status : Wrong ***Marks : 0/1***

2. 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

5

Status : Wrong ***Marks : 0/1***

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

```
import java.util.*;

class OperatorPrecedenceExample {
   public static void main(String[] args) {
      int a = 5, b = 3, c = 2;
      int result = a + b * c;

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

Answer

16

Status : Wrong ***Marks : 0/1***

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

Answer

string

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

5. 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

4

Status : Wrong ***Marks : 0/1***

6. 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***

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

Answer

double

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

8. 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***

9. 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

3.0

Status : Wrong ***Marks : 0/1***

10. 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***

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

Answer

char

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

12. 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

false

Status : Wrong ***Marks : 0/1***

13. 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***

14. 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***

15. 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***

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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

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

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

      // Read the two integers
      int num1 = scanner.nextInt();
      int num2 = scanner.nextInt();

      // Check the conditions
      boolean isPositiveNum1 = num1 > 0;
      boolean isNotDivisibleBy3Num2 = num2 % 3 != 0;

      boolean isPositiveNum2 = num2 > 0;
      boolean isNotDivisibleBy3Num1 = num1 % 3 != 0;

      // If one of the integers is positive and the other is not divisible by 3
      if ((isPositiveNum1 && isNotDivisibleBy3Num2) || (isPositiveNum2 &&
isNotDivisibleBy3Num1)) {
         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.");
      }

      // Close scanner to avoid resource leak
      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_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

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

public class Main{
   public static void main(String[] args) {
      // Create a scanner object to take input from the user
      Scanner scanner = new Scanner(System.in);

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

      // Convert the integer to a double
      double convertedDouble = (double) originalInteger;

      // Print the original integer and the converted double
      System.out.println("Original Integer: " + originalInteger);
      System.out.println("Converted Double: " + convertedDouble);

      // Close the scanner to avoid resource leak
      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_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

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

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

Input Format

The input consists of two space-separated integers.

Output Format

The output prints:

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

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1 2

Output: Sum is Not Multiple of Product

Answer

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

public class Main {
    public static void main(String[] args) {
        // Create a scanner object to take input
        Scanner scanner = new Scanner(System.in);

        // Read two integers from input
        int a = scanner.nextInt();
        int b = scanner.nextInt();

        // Calculate the sum and product of the two integers
        int sum = a + b;
        int product = a * b;

        // Check if the sum is a multiple of the product
        if (product != 0 && sum % product == 0) {
            System.out.println("Sum is Multiple of Product");
        } else {
            System.out.println("Sum is Not Multiple of Product");
        }

        // Close the scanner to avoid resource leak
        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_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement:

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

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

C = 2 * 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

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

public class Main {
    public static void main(String[] args) {
        // Create a scanner to read input from the user
        Scanner scanner = new Scanner(System.in);
```

```
        // Read the radius from user input
        double radius = scanner.nextDouble();

        // Define the constant for pi
        double pi = 3.14159;

        // Calculate the circumference and area
        double circumference = 2 * pi * radius;
        double area = pi * radius * radius;

        // Output the results, rounded to two decimal places
        System.out.printf("Circumference: %.2f meters\n", circumference);
        System.out.printf("Area: %.2f square meters\n", area);

        // 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_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

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

public class Main {
    public static void main(String[] args) {
        // Create a scanner object to read input
        Scanner scanner = new Scanner(System.in);

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

        // Read the number of bits N
        int N = scanner.nextInt();

        // Create a mask with the lowest N bits set to 1
        int mask = (1 << N) - 1;

        // Perform the bitwise AND to extract the lowest N bits
        int result = X & mask;

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

        // 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_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 {
   public static void main(String[] args) {
      // Create a scanner object to read input
      Scanner scanner = new Scanner(System.in);

      // Read the two integers input1 and input2
      int input1 = scanner.nextInt();
      int input2 = scanner.nextInt();

      // Check if either input1 or input2 is less than or equal to zero and odd
      boolean result = (input1 <= 0 && input1 % 2 != 0) || (input2 <= 0 && input2 %
2 != 0);

      // Output the result
      System.out.println(result);

      // 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_Q8

Attempt : 1
Total Mark : 10
Marks Obtained : 5

Section 1 : Coding

1. Problem Statement

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

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

Note: Use the ternary operator

Input Format

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

Output Format

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

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

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

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
6
10

Output: 6.67
Average is greater than both 4 and 6

Answer

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

public class Main {
    public static void main(String[] args) {
        // Create a scanner object to read input
        Scanner scanner = new Scanner(System.in);

        // Read the three expenses (a, b, c)
        int a = scanner.nextInt();
        int b = scanner.nextInt();
        int c = scanner.nextInt();
```

```
        // Calculate the average of the three expenses
        double average = (a + b + c) / 3.0;

        // Round the average to two decimal places
        System.out.printf("%.2f\n", average);

        // Find the two smallest expenses using Math.min
        int smallest = Math.min(a, Math.min(b, c));
        int largest = Math.max(a, Math.max(b, c));
        int middle = a + b + c - smallest - largest;  // The remaining one is the middle

        // Use a ternary operator to print the appropriate message
        String message = (average > smallest && average > middle) ?
            String.format("Average is greater than both %d and %d", smallest,
middle) :
            "Average is not greater than two smallest expenses";

        System.out.println(message);

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

Status : Partially correct ***Marks : 5/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q9

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

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

Use the relational operator to solve the program.

Input Format

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

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

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

Output Format

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

The second line displays one of the following:

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

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
7
10
Output: false
The second integer is not halfway between the first and third integers.

Answer

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

public class Main {
    public static void main(String[] args) {
        // Create a scanner object to read input
        Scanner scanner = new Scanner(System.in);

        // Read the three sensor readings
        int S1 = scanner.nextInt();
        int S2 = scanner.nextInt();
        int S3 = scanner.nextInt();
```

```
        // Calculate the midpoint between S1 and S3
        int midpoint = (S1 + S3) / 2;

        // Check if S2 is equal to the midpoint
        boolean isMidpoint = (S2 == midpoint);

        // Output the boolean result
        System.out.println(isMidpoint);

        // Output the appropriate message based on the result
        if (isMidpoint) {
            System.out.println("The second integer is halfway between the first and
third integers.");
        } else {
            System.out.println("The second integer is not halfway between the first
and third integers.");
        }

        // 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_Q10

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

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

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

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

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

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

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

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

Calculate the total work completed in the first d1 days by A, B, and C.Calculate the work completed in the next d2 days by A and B.Determine the remaining work after these d1 + d2 days.

Input Format

The first line of input contains five space-separated integers: x y z d1 d2

where:

x represents the Days A takes to complete the work alone

y represents the Days B takes to complete the work alone

z represents the Days C takes to complete the work alone

d1 represents the Days A, B, and C work together

d2 represents the Days A and B work together (after C leaves)

Output Format

The first line of output prints "Work done in first d1 days (A+B+C): " followed by a double value rounded to 2 decimal places.

The second line of output prints "Work done in next d2 days (A+B): " followed by a double value rounded to 2 decimal places.

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

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10 20 30 2 2

Output: Work done in first d1 days (A+B+C): 0.37
Work done in next d2 days (A+B): 0.30
Remaining work: 0.33

Answer

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

class WorkDistribution {
    // Method to calculate work done and remaining work
    public static void calculateWork(int x, int y, int z, int d1, int d2) {
        // Calculating individual work rates
        double rateA = 1.0 / x;
        double rateB = 1.0 / y;
        double rateC = 1.0 / z;

        // Work done in the first d1 days by A, B, and C together
        double workDoneInD1 = (rateA + rateB + rateC) * d1;

        // Work done in the next d2 days by A and B together
        double workDoneInD2 = (rateA + rateB) * d2;

        // Total work done in the first d1 + d2 days
        double totalWorkDone = workDoneInD1 + workDoneInD2;

        // Remaining work (1 represents the total work to be completed)
        double remainingWork = 1.0 - totalWorkDone;

        // Output results with two decimal places
        System.out.printf("Work done in first d1 days (A+B+C): %.2f\n",
workDoneInD1);
        System.out.printf("Work done in next d2 days (A+B): %.2f\n",
workDoneInD2);
        System.out.printf("Remaining work: %.2f\n", remainingWork);
    }
}

public class Main {
    public static void main(String[] args) {
        // Create a Scanner object for user input
        Scanner scanner = new Scanner(System.in);

        // Reading input values
        int x = scanner.nextInt();  // Days A takes to complete work alone
        int y = scanner.nextInt();  // Days B takes to complete work alone
        int z = scanner.nextInt();  // Days C takes to complete work alone
        int d1 = scanner.nextInt(); // Days A, B, and C work together
```

```
        int d2 = scanner.nextInt(); // Days A and B work together

        // Call the method to calculate work
        WorkDistribution.calculateWork(x, y, z, d1, d2);

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

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