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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_CY

Attempt : 2
Total Mark : 40
Marks Obtained : 40

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

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

public class Main{
   public static void main(String[] args){
      Scanner myobj = new Scanner(System.in);
      int a = myobj.nextInt();
      if(a%5==0)
      System.out.printf("%d is a multiple of 5",a);
      else if(a%7==0)
      System.out.printf("%d is a multiple of 7",a);
      else if(a%5!=0 && a%7!=0)
      System.out.printf("%d is neither multiple of 5 nor 7",a);


   }
}
```

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

2. Problem Statement

Raj is solving a physics problem involving projectile motion, where he

needs to calculate the time a ball hits the ground using a quadratic equation of the form $ax^2 + bx + c = 0$. Depending on the coefficients, the ball may hit the ground once, twice, or not at all in real time.

Help Raj find all real roots of the equation, if any.

Note: discriminant = b2 - 4ac

Input Format

The input consists of three space-separated doubles a, b, and c, representing the coefficients of the quadratic equation.

Output Format

If there are two real roots, print:

- "Two real solutions:"
- "Root1 = <value>"
- "Root2 = <value>"

If there is one real root, print:

- "One real solution:"
- "Root = <value>"

If there are no real roots, print:

- "There are no real solutions."

Note: values are rounded to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1 6 9
Output: One real solution:
Root = -3.00

Answer

```
import java.util.Scanner;

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

        double a = sc.nextDouble();
        double b = sc.nextDouble();
        double c = sc.nextDouble();

        double discriminant = b * b - 4 * a * c;

        if (discriminant > 0) {
            double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
            double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
            System.out.println("Two real solutions:");
            System.out.printf("Root1 = %.2f%n", root1);
            System.out.printf("Root2 = %.2f%n", root2);
        } else if (discriminant == 0) {
            double root = -b / (2 * a);
            System.out.println("One real solution:");
            System.out.printf("Root = %.2f%n", root);
        } else {
            System.out.println("There are no real solutions.");
        }

        sc.close();
    }
}
```

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

3. Problem Statement

Noah is analyzing numbers within a given range [A, B] and wants to calculate a special sum. For each number in the range, he calculates the product of its odd digits (ignoring even digits). If the number contains no odd digits, it is skipped. The sum of these products for all numbers in the range is the result.

Write a program to compute this sum.

Example

Input:

10 12

Output:

3

Explanation:

For 10, odd digits = 1, product = 1.

For 11, odd digits = 1, 1, product = 1 * 1 = 1.

For 12, odd digits = 1, product = 1.

Total sum = 1 + 1 + 1 = 3

Input Format

The input consists of two space-separated integers A and B, representing the inclusive range boundaries.

Output Format

The output prints a single integer representing the sum of the products of odd digits for all numbers in the range.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10 12
Output: 3

Answer

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

public class Main{
```

```
public static void main(String[] args){
    Scanner myobj = new Scanner(System.in);
    int a=myobj.nextInt();
    int b=myobj.nextInt();
    int sum=0;
    int c;
    /*for(int i=a;i<=b;i++){
        if(i%2==0){
            product=1;
            sum+=product;
        }

        else{
            int temp=i;
            product=1;
            while(temp>0){
            c=temp%10;
            temp=temp/10;
            product*=c;
            //sum+=product;
            }
            sum+=product;
        }
    }*/
    for (int i = a; i <= b; i++) {
        int product = 1;
        boolean OddDigit = false;

        int temp = i;
        while (temp > 0) {
            int digit = temp % 10;
            if (digit % 2 == 1) {  // odd digit
                product *= digit;
                OddDigit = true;
                temp /= 10;
            }
            //temp /= 10;
            else{
                product *=1;
                temp/=10;
            }
        }
```

```
            if (OddDigit) {
                sum += product;
            }
        }
        System.out.println(sum);

    }
}
```

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

4. 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

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

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

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

        double bmi = weight / (height * height);
        System.out.printf("BMI: %.2f%n", bmi);

        if (bmi < 18.5) {
            System.out.println("Classification: Underweight");
        } else if (bmi <= 24.9) {
            System.out.println("Classification: Normal Weight");
        } else if (bmi <= 29.9) {
            System.out.println("Classification: Overweight");
        } else {
            System.out.println("Classification: Obese");
        }

        sc.close();
    }
}
```

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