Rajalakshmi Engineering College

Name: DARSHAN M
Email: 241501040@rajalakshmi.edu.in
Roll no: 241501040
Phone: 9360697087
Branch: REC
Department: AI & ML - Section 1
Batch: 2028
Degree: B.E - AI & ML

2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 40

Section 1 : Coding

1. 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

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

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int A = sc.nextInt();
        int B = sc.nextInt();
        int totalSum = 0;

        for (int num = A; num <= B; num++) {
            int temp = num;
            int product = 1;
```

```
        boolean hasOdd = false;

        while (temp > 0) {
           int digit = temp % 10;
           if (digit % 2 != 0) { // odd digit
              product *= digit;
              hasOdd = true;
           }
           temp /= 10;
        }

        if (hasOdd) {
           totalSum += product;
        }
     }

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

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 ax² + 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

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

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) {
            // Two real solutions
            double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
            double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
```

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

Status : Correct   *Marks : 10/10*

3. 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

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

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

    if (N % 5 == 0 && N % 7 != 0) {
        System.out.println(N + " is a multiple of 5");
    } else if (N % 7 == 0) {
        System.out.println(N + " is a multiple of 7");
    } else {
        System.out.println(N + " is neither multiple of 5 nor 7");
    }
  }
}
```

Status : Correct   *Marks : 10/10*

4. 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

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

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

        // Increasing part
        for (int i = 1; i <= rows; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        // Decreasing part
        for (int i = rows - 1; i >= 1; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }
    }
}
```

Status : Correct   *Marks : 10/10*