

# Rajalakshmi Engineering College

Name: Aldrine Linjoe.s

Email: 240701033@rajalakshmi.edu.in

Roll no: 240701033

Phone: 7092049029

Branch: REC

Department: CSE - Section 10

Batch: 2028

Degree: B.E - CSE

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## 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**

Maya, a student in an arts and crafts class, wants to create a pattern using stars (\*) in a specific format. She plans to use a program to help her construct the pattern.

Write a program that takes an integer as input and constructs the following pattern using nested for loops.

Input: 5

Output:

\*

\*\*

```
***  
***  
*****  
***  
**  
*
```

### ***Input Format***

The input consists of a number (integer) representing the number of rows.

### ***Output Format***

The output displays the required pattern.

Refer to the sample output for the formatting specifications.

### ***Sample Test Case***

Input: 5

Output: \*

```
**  
***  
*****  
***  
**  
*
```

### ***Answer***

```
// You are using Java  
import java.util.*;  
class rec{  
    public static void main(String[] args){  
        Scanner sc=new Scanner(System.in);
```

```
int a=sc.nextInt();
for(int i=1;i<=a;i++){
    for(int j=0;j<i;j++){
        System.out.print("* ");
    }
    System.out.println();
}
for(int i=1;i<=a;i++){
    for(int j=a;j>i;j--){
        System.out.print("* ");
    }
    System.out.println();
}
}
```

**Status :** Correct

**Marks :** 10/10

## 2. Problem Statement

Ted, the computer science enthusiast, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Guide Ted in designing and writing the code to solve this problem using a 'do-while' loop.

### ***Input Format***

The input consists of an integer N, representing the number to be checked.

### ***Output Format***

If the sum is equal to the number of digits, print "The number of digits in N matches the sum of its digits."

Else, print "The number of digits in N does not match the sum of its digits."

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 20

Output: The number of digits in 20 matches the sum of its digits.

### **Answer**

```
// You are using Java
import java.util.*;
class rec{
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        int a=sc.nextInt();
        int m=Math.abs(a);
        int k=a;
        int c=0;
        int s=0;
        do{
            int d=m%10;
            s+=d;
            m=m/10;
            c++;
        }while(m>0);
        if(s==c){
            System.out.print("The number of digits in "+k+" matches the sum of its
digits.");
        }else{
            System.out.print("The number of digits in "+k+" does not match the sum
of its digits.");
        }
    }
}
```

**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.*;
class rec{
```

```
public static void main(String[] args){  
    Scanner sc=new Scanner(System.in);  
    int a=sc.nextInt();  
    int b=sc.nextInt();  
    int s=0;  
    int c=0;  
    for(int i=a;i<=b;i++){  
        int m=i;  
        int k=1;  
        boolean p=false;  
        while(m>0){  
            int d=m%10;  
            if(d%2!=0){  
                k=k*d;  
                p=true;  
            }  
            m=m/10;  
        }  
        if(p){  
            s=s+k;  
        }  
    }  
    System.out.print(s);  
}
```

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.*;
class rec{
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        double a=sc.nextDouble();
        double b=sc.nextDouble();
        double m=b/(a*a);
        System.out.printf("BMI: %.2f\n",m);
        if(m<=18.5){
```

```
        System.out.println("Classification: Underweight");
    }else if(m>=18.6 && m<=24.9){
        System.out.println("Classification: Normal weight");
    }else if(m>=25.0 && m<=29.9){
        System.out.println("Classification: Overweight");
    }else if(m>=30.0){
        System.out.println("Classification: Obese");
    }
}
```

**Status :** Correct

**Marks :** 10/10