C-DAC Mumbai

Lab Assignment: 3

- **Name:***Akash Bhadane*

<u>Problem 1:</u> Sum of Two Numbers (Using a Method)/ (Notepad++)
Problem Statement:
Write a Java program that includes a method to calculate the sum of two numbers.

1. Create a method sumOfTwoNumbers() that takes two integers as parameters, calculates their sum, and returns the result.
2. In the main method, use the Scanner class to prompt the user to enter two integers.
3. Pass the user inputs to the sumOfTwoNumbers() method and print the sum.

Sample Input:

Enter first number: 15 Enter second number: 25
Expected Output:

The sum of 15 and 25 is 40.

sum.java

```java
import java.util.Scanner;

class sum {
    public static int sumOfTwoNumbers(int a,int b)
    {
        return a+b;

    }
 public static void main(String args[])
 {
     int num1,num2,result;

   Scanner se = new Scanner(System.in);

   System.out.print("Enter frist number :");
   num1 = se.nextInt();

   System.out.print("Enter second number:");
   num2 = se.nextInt();

   result = sumOfTwoNumbers(num1,num2);

   System.out.println("The sum of " + num1 + " and " + num2 + " is " +result);

 }
}
```

<u>Output:</u>

```
Windows PowerShell
PS D:\0 - CDAC 2025\Assignment 3> javac sum.java
PS D:\0 - CDAC 2025\Assignment 3> java sum.java
Enter frist number :15
Enter second number:25
The sum of 15 and 25 is 40
PS D:\0 - CDAC 2025\Assignment 3>
```

Problem 2: **Simple Age Checker (Using a Method)**
Problem Statement:
Write a Java program that includes a method to check the age category.

1. Create a method checkAgeCategory() that takes an integer (age) as a parameter and prints whether the user is a minor, adult, or senior citizen.
2. In the main method, use the Scanner class to prompt the user to enter their age.
3. Pass the user's age to the checkAgeCategory() method.

Sample Input:
Enter your age: 30

Expected Output:
You are an adult.

sum.java AgeChecker.java

```java
import java.util.Scanner;
class AgeChecker{


    public static void checkAgeCategory(int age)
    {
        if(age < 18)
        {
            System.out.println("You are a minor");
        }
        else if(age >= 18 && age< 60)
        {
            System.out.println("You are an Adult");
        }
        else
        {
            System.out.println("You are a senior citizen");
        }
    }


    public static void main(String args[])
    {
        int age;
        Scanner se = new Scanner(System.in);

        System.out.print("Enter your age: ");
        age = se.nextInt();

        checkAgeCategory(age);
    }
}
```

OutPut:

```
Windows PowerShell
PS D:\0 - CDAC 2025\Assignment 3> java AgeChecker.java
Enter your age: 30
You are an Adult
PS D:\0 - CDAC 2025\Assignment 3>
```

Problem 3: Print Even Numbers (Using while Loop)
Problem Statement:
Write a Java program that prints all even numbers between 1 and 50 using a while loop.

1. Create a method printEvenNumbers() that prints all even numbers from 1 to 50.
2. Use a while loop to iterate from 1 to 50 and print the even numbers.

Sample Output:

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

EvenNum.java

```java
class EvenNum{

 public static void printEvenNumbers()
 {
     int i = 1;

     while(i<= 50)
     {
         if(i % 2 == 0)
         {
             System.out.print(i +" ");
         }
         i++;
     }
 }

 public static void main(String args[])
 {
     printEvenNumbers();
 }

}
```

Output:

```
Windows PowerShell
PS D:\0 - CDAC 2025\Assignment 3> javac EvenNum.java
PS D:\0 - CDAC 2025\Assignment 3> java EvenNum.java
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
PS D:\0 - CDAC 2025\Assignment 3>
```

Problem 4: **User Input for Positive Numbers (Using do-while Loop)**
Problem Statement:
Write a Java program that repeatedly asks the user to enter a positive number.

1. Create a method askForPositiveNumber() that uses a do-while loop to ask the user for a number until they enter a positive number.
2. Use the Scanner class to take the user's input.
3. Once a positive number is entered, the program should display the number.

Sample Input:

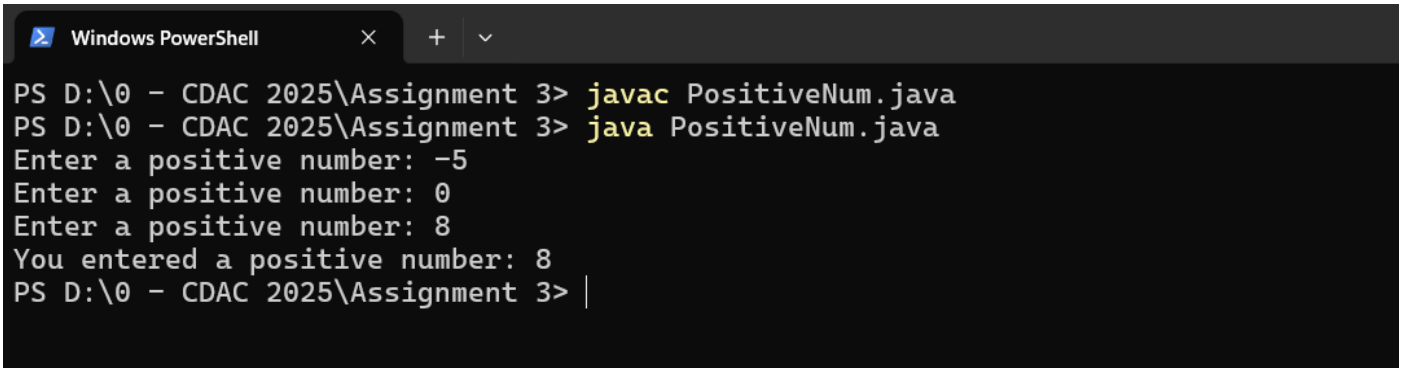
Enter a positive number: -5 Enter a positive number: 0 Enter a positive number: 8
Expected Output:

You entered a positive number: 8

PositiveNum.java

```java
import java.util.Scanner;

public class PositiveNum {

    public static void askForPositiveNumber()
    {
        Scanner se = new Scanner(System.in);
        int num;


        do
        {
            System.out.print("Enter a positive number: ");
            num = se.nextInt();

        } while (num <= 0);

        System.out.println("You entered a positive number: " + num);

        se.close();
    }

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

Output:



Problem 5: Print Multiplication Table (Using for Loop)

Problem Statement:

Write a Java program that prints the multiplication table for a given number (e.g., number 5) using a for loop. The program should:

1. Create a method printMultiplicationTable() that takes a number as a parameter and prints its multiplication table from 1 to 10.
2. Use a for loop to iterate through numbers 1 to 10 and print the multiplication results.

Sample Input: Enter a number: 5

Expected Output: 5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

MultiplicationTable.java

```java
import java.util.Scanner;

class MultiplicationTable
{

    public static void printMultiplicationTable(int n)
    {
        int i;
        for(i=1;i <= 10;i++)
        {
            System.out.println(n + " x " + i + " = " + (n * i));
        }
    }

public static void main(String args[])
 {
    int num;

  Scanner se = new Scanner(System.in);

  System.out.print("Enter a number: ");
  num=se.nextInt();

  printMultiplicationTable(num);

 }

}
```

Output:

Windows PowerShell

```
PS D:\0 - CDAC 2025\Assignment 3> javac MultiplicationTable.java
PS D:\0 - CDAC 2025\Assignment 3> java  MultiplicationTable.java
Enter a number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
PS D:\0 - CDAC 2025\Assignment 3>
```

Problem 6: Calculate the Sum of Numbers from 1 to N (Using for Loop)

Problem Statement:

Write a Java program that calculates the sum of all integers from 1 to N (where N is a positive integer) using a for loop. The program should:

1. Create a method calculateSum() that takes a number N and calculates the sum of all integers from 1 to N.
2. Use a for loop to iterate through all integers from 1 to N and add them up.

Sample Input:

Enter a number: 5

Expected Output:

The sum of numbers from 1 to 5 is: 15

SumCalculator.java

```java
import java.util.Scanner;

public class SumCalculator {


    public static int calculateSum(int num)
    {
        int sum = 0;
        int i;
        for (i = 1; i <= num; i++)
        {
            sum += i;
        }
        return sum;
    }

    public static void main(String[] args)
    {
    int N;

        Scanner sc = new Scanner(System.in);


        System.out.print("Enter a number: ");

         N = sc.nextInt();


        int result = calculateSum(N);


        System.out.println("The sum of numbers from 1 to " + N + " is: " + result);


    }
}
```

Output:

```
Windows PowerShell
PS D:\0 - CDAC 2025\Assignment 3> javac SumCalculator.java
PS D:\0 - CDAC 2025\Assignment 3> java SumCalculator.java
Enter a number: 5
The sum of numbers from 1 to 5 is: 15
PS D:\0 - CDAC 2025\Assignment 3> java SumCalculator.java
Enter a number: 10
The sum of numbers from 1 to 10 is: 55
PS D:\0 - CDAC 2025\Assignment 3>
```

Bonus Problem: Menu-Driven Java Program (Switch-Case)

Problem Statement:

You are required to write a **menu-driven Java program** that implements **four separate problems**. The program should allow the user to select which problem to run, execute the corresponding logic, and then return to the menu until the user chooses to exit.

The four problems are as follows (Already done in assignment 2, just put it in switch case):

Problem 1: Grade Evaluation System Problem,2: Leap Year Check Problem ,3: Day of the week

Problem 4: Identify Default Values of Variables Case 5: Exit

SumCalculator.java | MenuDriven.java

```java
import java.util.Scanner;

public class MenuDriven {


    public static void gradeEvaluation()
    {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter marks in 3 subjects: ");

        int m1 = sc.nextInt();
        int m2 = sc.nextInt();
        int m3 = sc.nextInt();

        int avg = (m1 + m2 + m3) / 3;

        if (avg >= 90)
        {
            System.out.println("Grade A");
        }
        else if (avg >= 70)
        {
            System.out.println("Grade B");
        } else if (avg >= 50)
        {
            System.out.println("Grade C");
        } else if (avg >= 30)
        {
            System.out.println("Grade D");
        } else
        {
            System.out.println("Fail");
        }
    }

```

```java

    public static void leapYearCheck()
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a year: ");

        int year = sc.nextInt();

        if ((year % 400 == 0) || (year % 4 == 0 && year % 100 != 0))
        {
            System.out.println(year + " is a Leap Year.");

        } else
        {
            System.out.println(year + " is NOT a Leap Year.");
        }
    }

```

```java
    public static void dayOfWeek()
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter day number (1-7): ");

        int day = sc.nextInt();

        switch (day)
        {
            case 1:
            System.out.println("Monday");
            break;

            case 2:
            System.out.println("Tuesday");
            break;

            case 3:
            System.out.println("Wednesday");
            break;

            case 4:
            System.out.println("Thursday");
            break;

            case 5:
            System.out.println("Friday");
            break;

            case 6:
            System.out.println("Saturday");
            break;

            case 7:
            System.out.println("Sunday");
            break;

            default:
            System.out.println("Invalid day number!");
        }
    }
```

```java


    public static void defaultValues()
    {
        System.out.println("Default values of instance variables in Java:");
        System.out.println("byte = 0");
        System.out.println("short = 0");
        System.out.println("int = 0");
        System.out.println("long = 0L");
        System.out.println("float = 0.0f");
        System.out.println("double = 0.0d");
        System.out.println("char = '\\u0000'");
        System.out.println("boolean = false");
        System.out.println("Objects = null");
    }
```

SumCalculator.java | MenuDriven.java

```
112
113     public static void main(String[] args)
114     {
115         Scanner sc = new Scanner(System.in);
116         int choice;
117
118         do {
119
120             System.out.println("\n======== MENU ========");
121
122             System.out.println("1. Grade Evaluation System");
123             System.out.println("2. Leap Year Check");
124             System.out.println("3. Day of the Week");
125             System.out.println("4. Identify Default Values of Variables");
126             System.out.println("5. Exit");
127
128             System.out.print("Enter your choice: ");
129             choice = sc.nextInt();
130
131
132             switch (choice)
133             {
134                 case 1: gradeEvaluation();
135                 break;
136
137                 case 2: leapYearCheck();
138                 break;
139
140                 case 3: dayOfWeek();
141                 break;
142
143                 case 4: defaultValues();
144                 break;
145
146                 case 5: System.out.println("Exiting program...");
147                 break;
148
149                 default: System.out.println("Invalid choice! Please try again.");
150             }
151
152         }
153         while (choice != 5);
```

```
154
155             sc.close();
156         }
157     }
158
```

Output:


Windows PowerShell
2. Leap Year Check
3. Day of the Week
4. Identify Default Values of Variables
5. Exit
Enter your choice: 2
Enter a year: 2019
2019 is NOT a Leap Year.
===== MENU =====
1. Grade Evaluation System
2. Leap Year Check
3. Day of the Week
4. Identify Default Values of Variables
5. Exit
Enter your choice: 3
Enter day number (1-7): 3
Wednesday
===== MENU =====
1. Grade Evaluation System
2. Leap Year Check
3. Day of the Week
4. Identify Default Values of Variables
5. Exit
Enter your choice: 4
Default values of instance variables in Java:
byte = 0
short = 0
int = 0
long = 0L
float = 0.0f
double = 0.0d
char = '\u0000'
boolean = false
Objects = null
===== MENU =====
1. Grade Evaluation System
2. Leap Year Check
3. Day of the Week
4. Identify Default Values of Variables
5. Exit
Enter your choice: 5
Exiting program...