# CDAC Mumbai PG-DAC AUGUST 24
# Assignment No- 2

1)Write a program that checks if a given year is a leap year or not using both if-else and switch-case.

LeapYearIfElse.java

```java
import java.util.Scanner;

public class LeapYearIfElse {

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

        System.out.print("Enter a year: ");
        int year = scanner.nextInt();

        if (year % 400 == 0) {
            System.out.println(year + " is a leap year.");
        } else if (year % 100 == 0) {
            System.out.println(year + " is not a leap year.");
        } else if (year % 4 == 0) {
            System.out.println(year + " is a leap year.");
        } else {
            System.out.println(year + " is not a leap year.");
        }
        scanner.close();
    }
}

```

```
PS F:\OOPJ_Assigment-2\Assignment> javac LeapYearIfElse.java
PS F:\OOPJ_Assigment-2\Assignment> java LeapYearIfElse
Enter a year: 4
4 is a leap year.
PS F:\OOPJ_Assigment-2\Assignment> java LeapYearIfElse
Enter a year: 2024
2024 is a leap year.
PS F:\OOPJ_Assigment-2\Assignment>
```

LeapYearCase.java

```java
import java.util.Scanner;

public class LeapYearCase {

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

        System.out.print("Enter a year: ");
        int year = scanner.nextInt();

        int result = (year % 400 == 0) ? 0 : (year % 100 == 0) ? 1 : (year % 4 == 0) ? 0 : 1;

        switch (result) {
            case 0:
                System.out.println(year + " is a leap year.");
                break;
            case 1:
                System.out.println(year + " is not a leap year.");
                break;
            default:
                System.out.println("Invalid input.");
                break;
        }

        scanner.close();
    }
}

```

2)Implement a program that calculates the Body Mass Index (BMI) based on height and weight input using if-else to classify the BMI int categories (underweight, normal weight, overweight,etc).

```java
import java.util.Scanner;

public class BMICalculator {

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

        System.out.print("Enter your weight in kilograms: ");
        double weight = scanner.nextDouble();

        System.out.print("Enter your height in meters: ");
        double height = scanner.nextDouble();

        double bmi = weight / (height * height);

        System.out.printf("Your BMI is: %.2f%n", bmi);

        if (bmi < 18.5) {
            System.out.println("You are underweight.");
        } else if (bmi >= 18.5 && bmi < 24.9) {
            System.out.println("You have a normal weight.");
        } else if (bmi >= 25 && bmi < 29.9) {
            System.out.println("You are overweight.");
        } else if (bmi >= 30 && bmi < 34.9) {
            System.out.println("You have obesity class I.");
        } else if (bmi >= 35 && bmi < 39.9) {
            System.out.println("You have obesity class II.");
        } else {
            System.out.println("You have obesity class III.");
        }

        scanner.close();
    }
}
```

```
Enter your weight in kilograms: 30
Enter your height in meters: 9
Your BMI is: 0.37
You are underweight.
PS F:\OOPJ_Assigment-2\Assignment>
```

3)Write a program that checks if a person is eligible to vote based on their age.

```java
import java.util.Scanner;

public class EligibleVoter{
    public static void main(String []args)
{
    Scanner scanner=new Scanner(System.in);
System.out.print("Enter your Age: ");
        int age = scanner.nextInt();

        if(age>18){
            System.out.println("You are Elgible to vote");
        }
        else{
            System.out.println("You are not elible to vote");
        }

        scanner.close();
}
}
```

```
PS F:\OOPJ_Assigment-2\Assignment> javac EligibleVoter.java
PS F:\OOPJ_Assigment-2\Assignment> java EligibleVoter
Enter your Age: 4
You are not elible to vote
PS F:\OOPJ_Assigment-2\Assignment> 99
99
```

4)Write a program that takes a month (1-12) and prints the corresponding season (Winter, Spring, Summer, Autumn) using a switch case

MonthSeason.java

```java
import java.util.Scanner;

public class MonthSeason {

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

        System.out.print("Enter a month number (1-12): ");
        int month = scanner.nextInt();

        String season;
        switch (month) {
            case 12:
            case 1:
            case 2:
                season = "Winter";
                break;
            case 3:
            case 4:
            case 5:
                season = "Spring";
                break;
            case 6:
            case 7:
            case 8:
                season = "Summer";
                break;
            case 9:
            case 10:
            case 11:
                season = "Autumn";
                break;
            default:
                season = "Invalid month. Please enter a number between 1 and 12.";
                break;
        }

        System.out.println("The season is: " + season);

        scanner.close();
    }
}
```

```
PS F:\OOPJ_Assigment-2\Assignment> javac MonthSeason.java
PS F:\OOPJ_Assigment-2\Assignment> java MonthSeason
Enter a month number (1-12): 10
The season is: Autumn
```

5)Write a program that allows the user to select a shape (Circle, Square, Rectangle, Triangle) and then calculates the area based on user-provided dimensions using a switch case.

AreaCalculator.java

```java
import java.util.Scanner;

public class AreaCalculator {

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

        System.out.println("Select a shape to calculate the area:");
        System.out.println("1. Circle");
        System.out.println("2. Square");
        System.out.println("3. Rectangle");
        System.out.println("4. Triangle");
        System.out.print("Enter your choice (1-4): ");
        int choice = scanner.nextInt();

        double area = 0;

        switch (choice) {
            case 1: // Circle
                System.out.print("Enter the radius of the circle: ");
                double radius = scanner.nextDouble();
                area = Math.PI * radius * radius;
                break;

            case 2: // Square
                System.out.print("Enter the side length of the square: ");
                double side = scanner.nextDouble();
                area = side * side;
                break;

            case 3: // Rectangle
                System.out.print("Enter the length of the rectangle: ");
                double length = scanner.nextDouble();
                System.out.print("Enter the width of the rectangle: ");
                double width = scanner.nextDouble();
                area = length * width;
                break;
```

```java
            case 4: // Triangle
                System.out.print("Enter the base of the triangle: ");
                double base = scanner.nextDouble();
                System.out.print("Enter the height of the triangle: ");
                double height = scanner.nextDouble();
                area = 0.5 * base * height;
                break;

            default:
                System.out.println("Invalid choice. Please select a number between 1 and 4.");
                break;
        }

        if (choice >= 1 && choice <= 4) {
            System.out.printf("The area is: %.2f%n", area);
        }

        scanner.close();
    }
}
```

```
PS F:\OOPJ_Assigment-2\Assignment> java AreaCalculator
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
Enter your choice (1-4): 3
Enter the length of the rectangle: 55
Enter the width of the rectangle: 22
The area is: 1210.00
PS F:\OOPJ_Assigment-2\Assignment> java AreaCalculator
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
Enter your choice (1-4): 1
Enter the radius of the circle: 6
The area is: 113.10
PS F:\OOPJ_Assigment-2\Assignment>
```