OOPJ
Assignment-2

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

```java
import java.util.Scanner;

public class LeapYear {
    public static void main(String[] args) {

        System.out.println("Enter year: ");
        Scanner sc = new Scanner(System.in);
        int year = sc.nextInt();

        int flag = 0;
        if(year % 400 == 0) {
            flag = 1;
        } else if (year % 100 == 0) {
            flag = 0;
        } else if (year % 4 == 0) {
            flag = 1;
        } else {
            flag = 0;
        }

        switch(flag) {
        case 1:
            System.out.println(year + " is a leap year");
            break;
        case 0:
            System.out.println(year + " is not a leap year");
            break;
        }
    }
}
```

Output:

```
Enter year:
1900
1900 is not a leap year

Enter year:
2024
2024 is a leap year
```

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 BMI {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        System.out.println("Enter your weight in kg: ");
        float w = sc.nextFloat();
        System.out.println("Enter your weight in metre: ");
        float h = sc.nextFloat();
        sc.close();

        float bmi = w/(h*h);

        if(bmi > 25) {
            System.out.println("You are overweight");
        } else if (bmi > 18.5) {
            System.out.println("You are normal weight");
        } else {
            System.out.println("You are underweight");
        }
    }
}
```

Output:

```
Enter your weight in kg:
73
Enter your weight in metre:
1.75
You are normal weight
```

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

```java
import java.util.Scanner;

public class Vote {

    public static void main (String[] args) {
        System.out.println("Enter your age:");
        Scanner sc = new Scanner(System.in);
        int age = sc.nextInt();
        sc.close();

        if(age >= 18)
            System.out.println("You are eligible for voting.");
        else
            System.out.println("You age not eligible for voting.");
    }
}
```

Output:

```
Enter your age:
27
You are eligible for voting.
```

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

```java
import java.util.Scanner;

public class Season {
    public static void main(String[] args) {

        System.out.println("Enter month number: ");
        Scanner sc = new Scanner(System.in);
        int month = sc.nextInt();
        sc.close();

        switch(month) {
        case 12:
        case 1:
        case 2:
            System.out.println("Winter season");
            break;
        case 3:
        case 4:
        case 5:
            System.out.println("Spring season");
            break;
```

```
            case 6:
            case 7:
            case 8:
                System.out.println("Summer season");
                break;
            case 9:
            case 10:
            case 11:
                System.out.println("Autumn season");
                break;
            default:
                System.out.println("Enter a valid month");
            }
        }
}
```

Output:

```
Enter month number
4
Spring season
```

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.

```
import java.util.Scanner;
import java.lang.Math;

public class Area {

    public static void main(String[] args) {

        System.out.println("1. Circle 2. Square 3. Rectange 4. Triangle");
        System.out.println("Enter a number to select shape:");
        Scanner sc = new Scanner(System.in);
        int num = sc.nextInt();

        switch(num) {
            case 1:
                System.out.println("Enter radius of circle: ");
                double r = sc.nextFloat();
                double a1 = Math.PI *r * r;
                System.out.println("Area of circle = " + a1);
                break;
            case 2:
                System.out.println("Enter side of square: ");
                double s = sc.nextDouble();
                double a2 = s*s;
                System.out.println("Area of square =" + a2);
                break;
```

```
            case 3:
                System.out.println("Enter length of rectangle: ");
                double l = sc.nextDouble();
                System.out.println("Enter bradth of rectangle: ");
                double b = sc.nextDouble();
                double a3 = l*b;
                System.out.println("Area of rectangle =" + a3);
                break;
            case 4:
                System.out.println("Enter 3 sides of triangle: ");
                double t1 = sc.nextDouble();
                double t2 = sc.nextDouble();
                double t3 = sc.nextDouble();
                double sp = (t1+t2+t3)/3;
                double a4 = Math.sqrt(sp*(sp-t1)*(sp-t2)*(sp-t3));
                break;
            default:
                System.out.println("Invalid number");
        }
    }
}
```

Output:

```
1. Circle 2. Square 3. Rectange 4. Triangle
Enter a number to select shape:
1
Enter radius of circle:
4
Area of circle = 50.26548245743669
```