OOPJ
Assignment-1

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;
		}

		sc.close();
	}
}
```

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).

```
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.

```
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.

```
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));
                System.out.println("Area of triangle =" + a4);
                break;
            default:
                System.out.println("Invalid number");
        }
        sc.close();
    }
}
```

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
```