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.

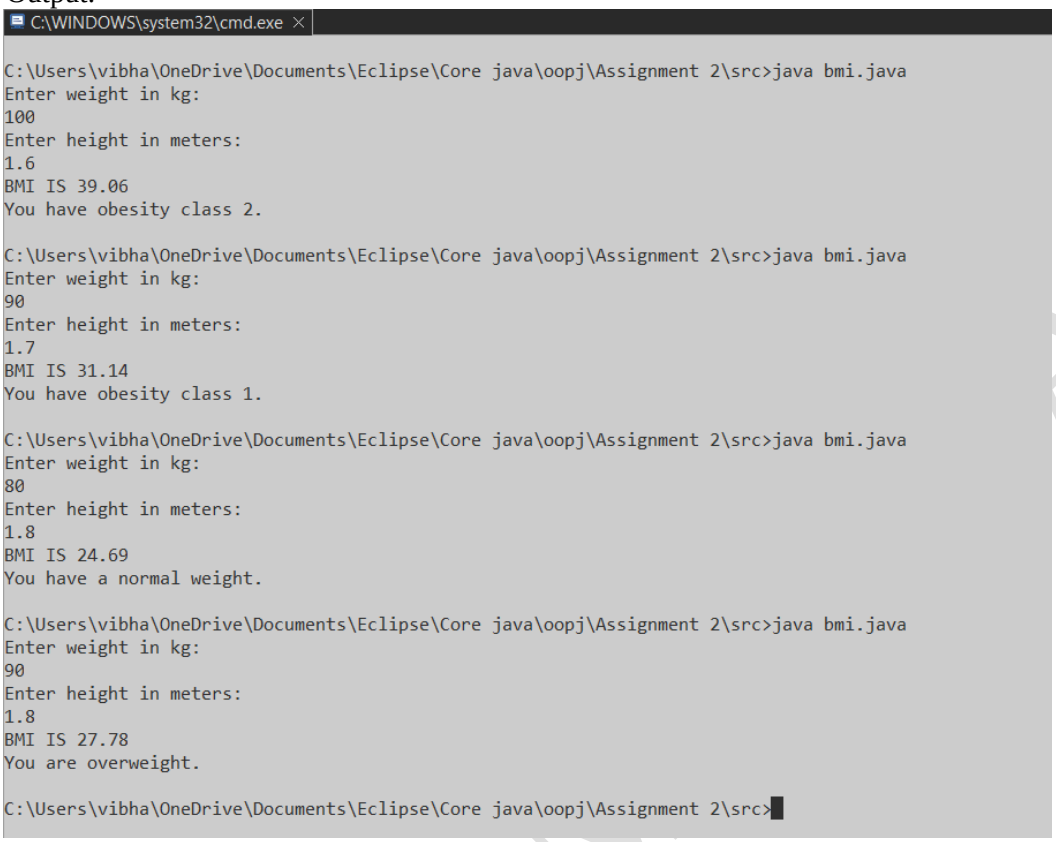
```java
import java.util.Scanner;
public class leap_year
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a year: ");
        int year = sc.nextInt();
        sc.close();

        // If the year is divisible by 400, it is a leap year.
        if(year%400==0)
        {
            System.out.println(year+" is a Leap year!");
        }

        // If the year is divisible by 100 but not by 400, it is not a leap year.
        else if(year%100==0 && year%400 != 0)
        {
            System.out.println(year+" is Not a Leap year!");
        }
        // If the year is divisible by 4 but not by 100, it is a leap year.
        else if(year%4==0 && year%100!=0)
        {
            System.out.println(year+" is a Leap year!");
        }
        else
        {
            System.out.println(year+" is Not a Leap year!");
        }
    }
}
```

```
Problems  Javadoc  Declaration  Terminal  Console
C:\WINDOWS\system32\cmd.exe  C:\WINDOWS\system32\cmd.exe  C:\WINDOWS\system32\cmd.exe

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java leap_year.java
Enter a year:
2024
2024 is a Leap year!

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java leap_year.java
Enter a year:
2001
2001 is Not 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 weight in kg: ");
        double weight = sc.nextDouble();
        System.out.println("Enter height in meters: ");
        double height = sc.nextDouble();
        double bmi = weight / (height*height);
        System.out.printf("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 1.");
        }
        else if (bmi >= 35 && bmi < 39.9)
        {
            System.out.println("You have obesity class 2.");
        }
        else
        {
            System.out.println("You have obesity class 3.");
        }
        sc.close();
    }
}

```

Output:



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

Code:

```java
import java.util.Scanner;

public class vote
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter your age: ");
        int age = sc.nextInt();
        if (age >= 18)
        {
            System.out.println("You are eligible to vote.");
        }
        else
        {
            System.out.println("You are not eligible to vote.");
        }
        sc.close();
    }
}
```

Problems Javadoc Declaration Terminal Console

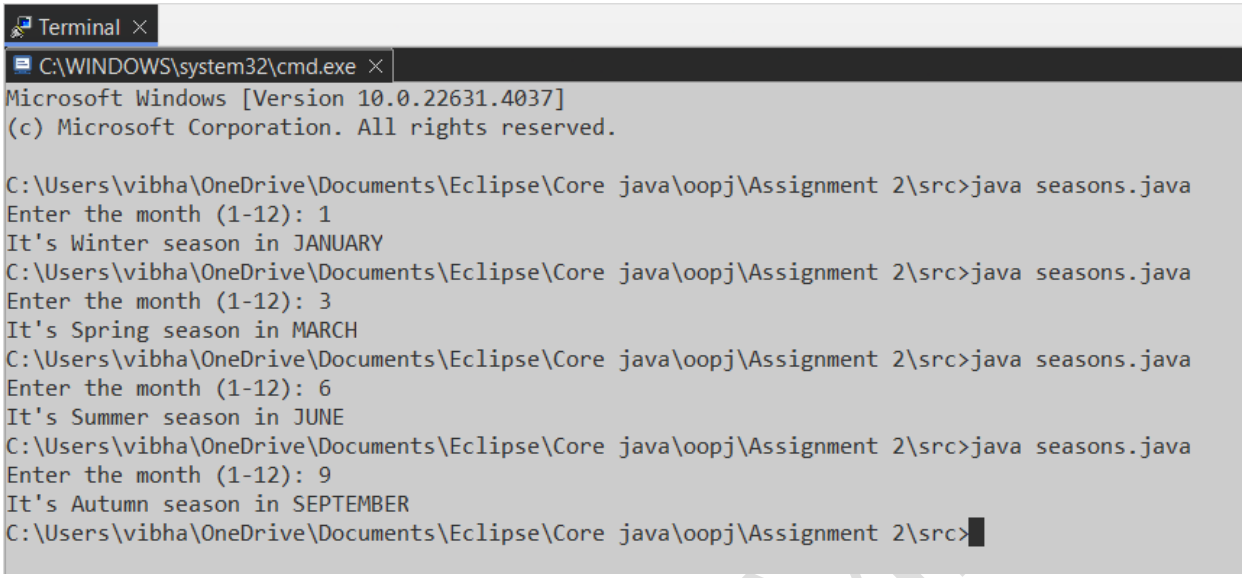
C:\WINDOWS\system32\cmd.exe

```
Microsoft Windows [Version 10.0.22631.4037]
(c) Microsoft Corporation. All rights reserved.

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java vote.java
Enter your age: 19
You are eligible to vote.

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java vote.java
Enter your age: 15
You are not eligible to vote.

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>
```

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;
import java.time.Month;
public class seasons
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the month (1-12): ");
        int month = sc.nextInt();
        String monthname = null;
        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!";
                break;
        }
        monthname=Month.of(month).toString();
        System.out.print("It's " + season + " season in " + monthname);
        sc.close();
    }
}

```

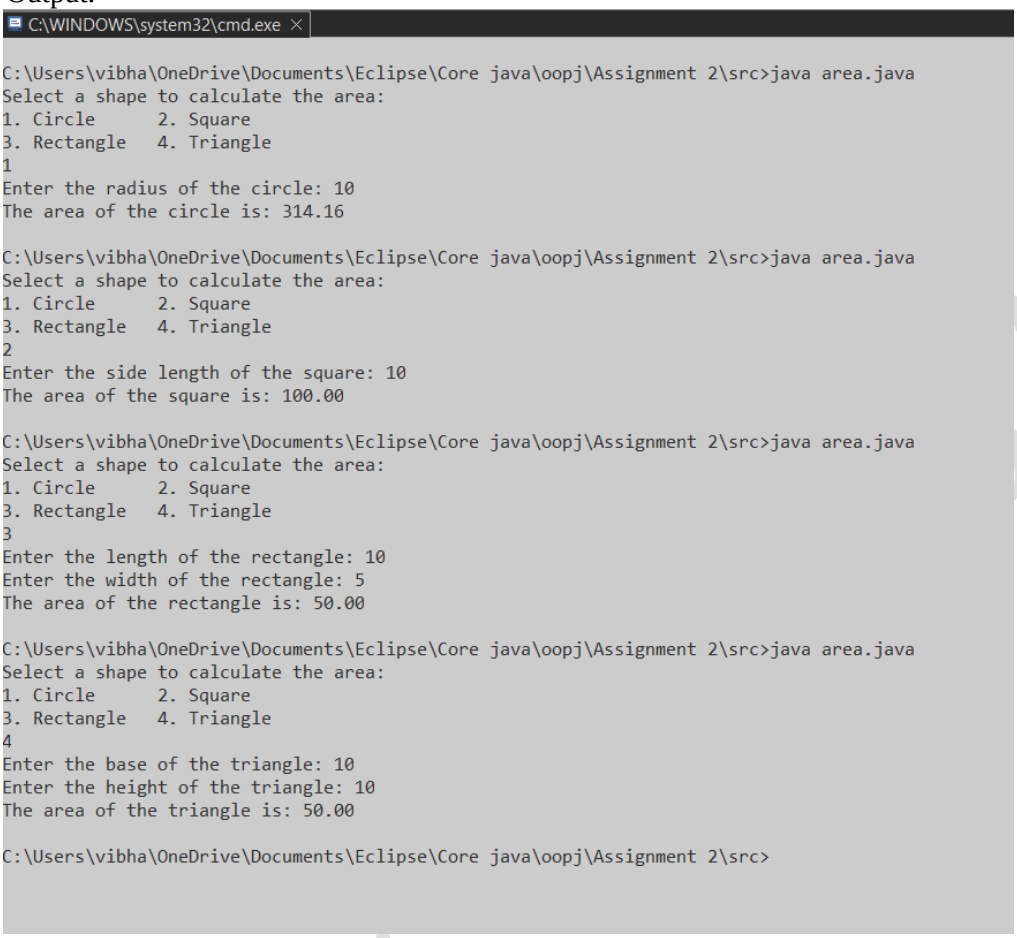
Output:


Terminal
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.22631.4037]
(c) Microsoft Corporation. All rights reserved.
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java seasons.java
Enter the month (1-12): 1
It's Winter season in JANUARY
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java seasons.java
Enter the month (1-12): 3
It's Spring season in MARCH
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java seasons.java
Enter the month (1-12): 6
It's Summer season in JUNE
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java seasons.java
Enter the month (1-12): 9
It's Autumn season in SEPTEMBER
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>

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.

```java
import java.util.Scanner;
public class area {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Select a shape to calculate the area:");
        System.out.println("1. Circle      2. Square");
        System.out.println("3. Rectangle   4. Triangle ");
        int choice = sc.nextInt();
        switch (choice)
        {
            case 1: // Circle
                System.out.print("Enter the radius of the circle: ");
                double radius = sc.nextDouble();
                double circleArea = Math.PI * radius * radius;
                System.out.printf("The area of the circle is: %.2f\n", circleArea);
                break;
            case 2: // Square
                System.out.print("Enter the side length of the square: ");
                double side = sc.nextDouble();
                double squareArea = side * side;
                System.out.printf("The area of the square is: %.2f\n", squareArea);
                break;
            case 3: // Rectangle
                System.out.print("Enter the length of the rectangle: ");
                double length = sc.nextDouble();
                System.out.print("Enter the width of the rectangle: ");
                double width = sc.nextDouble();
                double rectangleArea = length * width;
                System.out.printf("The area of the rectangle is: %.2f\n", rectangleArea);
                break;
            case 4: // Triangle
                System.out.print("Enter the base of the triangle: ");
                double base = sc.nextDouble();
                System.out.print("Enter the height of the triangle: ");
                double height = sc.nextDouble();
                double triangleArea = 0.5 * base * height;
                System.out.printf("The area of the triangle is: %.2f\n", triangleArea);
                break;
            default:
                System.out.println("Invalid choice! Please select a valid shape.");
                break;
        }
        sc.close();
    }
}
```

Output:


C:\WINDOWS\system32\cmd.exe
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java area.java
Select a shape to calculate the area:
1. Circle 2. Square
3. Rectangle 4. Triangle
1
Enter the radius of the circle: 10
The area of the circle is: 314.16
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java area.java
Select a shape to calculate the area:
1. Circle 2. Square
3. Rectangle 4. Triangle
2
Enter the side length of the square: 10
The area of the square is: 100.00
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java area.java
Select a shape to calculate the area:
1. Circle 2. Square
3. Rectangle 4. Triangle
3
Enter the length of the rectangle: 10
Enter the width of the rectangle: 5
The area of the rectangle is: 50.00
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java area.java
Select a shape to calculate the area:
1. Circle 2. Square
3. Rectangle 4. Triangle
4
Enter the base of the triangle: 10
Enter the height of the triangle: 10
The area of the triangle is: 50.00
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>