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.

LeapYear.java | BMI.java | VoteCheck.java | Climate.java | Shape.java

```java
import java.util.*;
class LeapYear {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the year you want to choose: ");
        int year = sc.nextInt();
        if (year % 4 == 0 || year % 400 == 0 && year %100 != 0)
        {
            System.out.println(+year+" is a leap year");
        }
        else
        {
            System.out.println(+year+" is not a leap year");
        }
    }
}
```

```
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22631.4037]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>javac LeapYear.java

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java LeapYear
Enter the year you want to choose:
2024
2024 is a leap year

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java LeapYear
Enter the year you want to choose:
2017
2017 is not a leap year

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>
```

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.)

LeapYear.java | BMI.java | VoteCheck.java | Climate.java | Shape.java

```java
import java.util.*;
class BMI {
    public static void main(String args[]) {
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter your height in cm. & weight in kg. ");
    int height = sc.nextInt();
    int weight = sc.nextInt();
    int bmi = (weight/height*height);
    System.out.println("Your BMI is: "+bmi);
        if (bmi < 18.5) {
            System.out.println("You are underweight");
        }
        else if (bmi >= 18.5 && bmi <= 24.9) {
            System.out.println("You are normal");
        }
        else if (bmi >= 25 && bmi <= 29.9) {
            System.out.println("You are overweight");
        }
        else {
            System.out.println("You are obese");
        }
    }
}
```

C:\Windows\System32\cmd.e

```
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>javac BMI.java

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java BMI
Enter your height in cm. & weight in kg.
170
80
Your BMI is: 0
You are underweight

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>
```

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

LeapYear.java | BMI.java | VoteCheck.java | Climate.java | Shape.java

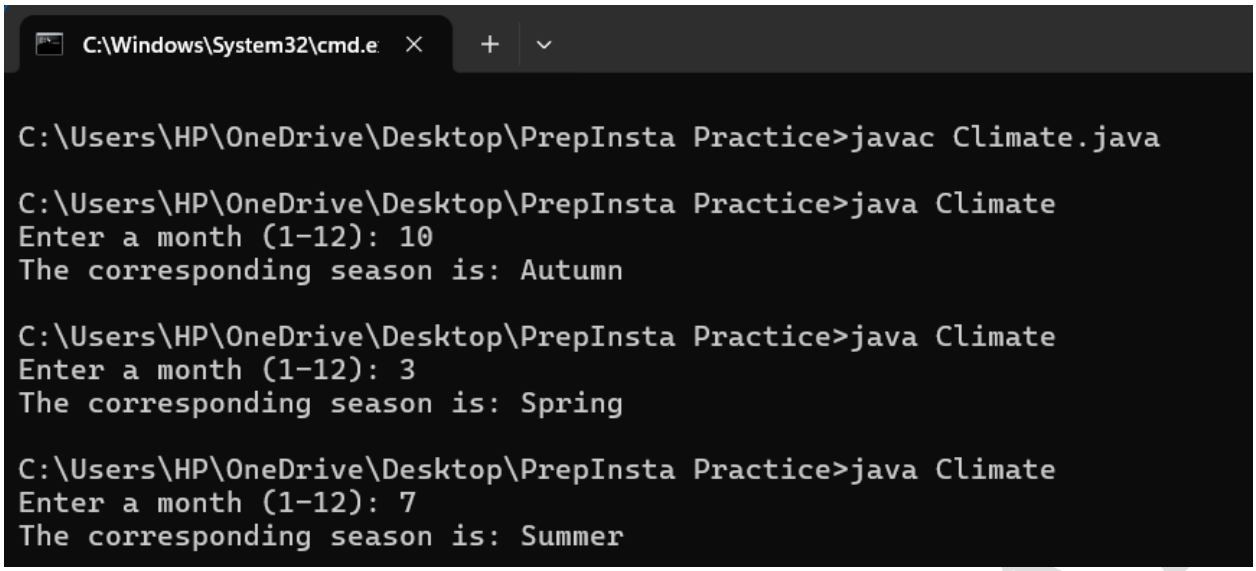
```java
import java.util.*;
class VoteCheck {
    public static void main(String args[]) {
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter your age : ");
    int age = sc.nextInt();
    if ( age >=120 || age <=0 )
    {
        System.out.println("Entered age: "+age+" is not proper");
    }
    else if (age >= 18)
    {
        System.out.println(+age+ " You can vote");
    }
    else
    {
        System.out.println(+age+ " You cannot vote");
    }
   }
}
```

```
C:\Windows\System32\cmd.e

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>javac VoteCheck.java

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java VoteCheck
Enter your age :
21
21 You can vote

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java VoteCheck
Enter your age :
13
13 You cannot vote

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>
```

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

LeapYear.java | BMI.java | VoteCheck.java | Climate.java | Shape.java

```
4       public static void main(String[] args) {
5           Scanner scanner = new Scanner(System.in);
6
7           // Taking user input for the month (1-12)
8           System.out.print("Enter a month (1-12): ");
9           int month = scanner.nextInt();
10
11          // Determining the season using switch-case
12          String season;
13          switch (month) {
14              case 12:
15              case 1:
16              case 2:
17                  season = "Winter";
18                  break;
19              case 3:
20              case 4:
21              case 5:
22                  season = "Spring";
23                  break;
24              case 6:
25              case 7:
26              case 8:
27                  season = "Summer";
28                  break;
29              case 9:
30              case 10:
31              case 11:
32                  season = "Autumn";
33                  break;
34              default:
35                  season = "Invalid month! Please enter a month between 1 and 12.";
36          }
37
38          // Output the season
39          System.out.println("The corresponding season is: " + season);
40
41          scanner.close();
42      }
```


C:\Windows\System32\cmd.e
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>javac Climate.java
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Climate
Enter a month (1-12): 10
The corresponding season is: Autumn
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Climate
Enter a month (1-12): 3
The corresponding season is: Spring
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Climate
Enter a month (1-12): 7
The corresponding season is: Summer

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.

LeapYear.java | BMI.java | VoteCheck.java | Climate.java | Shape.java

```
7           System.out.println("1. Circle");
8           System.out.println("2. Square");
9           System.out.println("3. Rectangle");
10          System.out.println("4. Triangle");
11
12          int choice = sc.nextInt();
13          double area = 0;
14
15          switch (choice) {
16              case 1:
17                  // Circle: Area = π * r^2
18                  System.out.print("Enter the radius of the circle: ");
19                  double radius = sc.nextDouble();
20                  area = 3.14 * radius * radius;
21                  System.out.println("Area of the circle: " + area);
22                  break;
23
24              case 2:
25                  // Square: Area = side^2
26                  System.out.print("Enter the side length of the square: ");
27                  double side = sc.nextDouble();
28                  area = side * side;
29                  System.out.println("Area of the square: " + area);
30                  break;
31
32              case 3:
33                  // Rectangle: Area = length * width
34                  System.out.print("Enter the length of the rectangle: ");
35                  double length = sc.nextDouble();
36                  System.out.print("Enter the width of the rectangle: ");
37                  double width = sc.nextDouble();
38                  area = length * width;
39                  System.out.println("Area of the rectangle: " + area);
40                  break;
41
42              case 4:
43                  // Triangle: Area = 0.5 * base * height
44                  System.out.print("Enter the base of the triangle: ");
45                  double base = sc.nextDouble();
46                  System.out.print("Enter the height of the triangle: ");
47                  double height = sc.nextDouble();
48                  area = 0.5 * base * height;
49                  System.out.println("Area of the triangle: " + area);
50                  break;
51
52              default:
53                  System.out.println("Invalid choice! Please select a valid shape.");
54          }
```

```
C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Shape
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
1
Enter the radius of the circle: 5
Area of the circle: 78.5

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Shape
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
2
Enter the side length of the square: 4
Area of the square: 16.0

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Shape
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
3
Enter the length of the rectangle: 3
Enter the width of the rectangle: 8
Area of the rectangle: 24.0

C:\Users\HP\OneDrive\Desktop\PrepInsta Practice>java Shape
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
4
Enter the base of the triangle: 5
Enter the height of the triangle: 10
Area of the triangle: 25.0
```