


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.

```
1 import java.util.Scanner;
2 public class leap_year
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter a year: ");
8         int year = sc.nextInt();
9         sc.close();
10
11         // If the year is divisible by 400, it is a leap year.
12         if(year%400==0)
13         {
14             System.out.println(year+" is a Leap year!");
15         }
16
17         // If the year is divisible by 100 but not by 400, it is not a leap year.
18         else if(year%100==0 && year%400 != 0)
19         {
20             System.out.println(year+" is Not a Leap year!");
21         }
22         // If the year is divisible by 4 but not by 100, it is a leap year.
23         else if(year%4==0 && year%100!=0)
24         {
25             System.out.println(year+" is a Leap year!");
26         }
27         else
28         {
29             System.out.println(year+" is Not a Leap year!");
30         }
31     }
32 }
```



The screenshot shows the Eclipse IDE interface with the Java code from the previous block in the editor. Below the editor, the 'Terminal' tab is active, displaying the execution of the program. The first run shows the input '2024' and the output '2024 is a Leap year!'. The second run shows the input '2001' and the output '2001 is Not a Leap year!'. The console window has a dark background and white text.

```
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 into categories (underweight, normal weight, overweight, etc).

```
1 import java.util.Scanner;
2 public class bmi
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc= new Scanner(System.in);
7         System.out.println("Enter weight in kg: ");
8         double weight = sc.nextDouble();
9         System.out.println("Enter height in meters: ");
10        double height = sc.nextDouble();
11        double bmi = weight / (height*height);
12        System.out.printf("BMI IS %.2f\n", bmi);
13        if (bmi < 18.5)
14        {
15            System.out.println("You are underweight.");
16        }
17        else if (bmi >= 18.5 && bmi < 24.9)
18        {
19            System.out.println("You have a normal weight.");
20        }
21        else if (bmi >= 25 && bmi < 29.9)
22        {
23            System.out.println("You are overweight.");
24        }
25        else if (bmi >= 30 && bmi < 34.9)
26        {
27            System.out.println("You have obesity class 1.");
28        }
29        else if (bmi >= 35 && bmi < 39.9)
30        {
31            System.out.println("You have obesity class 2.");
32        }
33        else
34        {
35            System.out.println("You have obesity class 3.");
36        }
37        sc.close();
38    }
39 }
40
```

Output:

```
C:\WINDOWS\system32\cmd.exe ×
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java bmi.java
Enter weight in kg:
100
Enter height in meters:
1.6
BMI IS 39.06
You have obesity class 2.

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java bmi.java
Enter weight in kg:
90
Enter height in meters:
1.7
BMI IS 31.14
You have obesity class 1.

C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java bmi.java
Enter weight in kg:
80
Enter height in meters:
1.8
BMI IS 24.69
You have a normal weight.

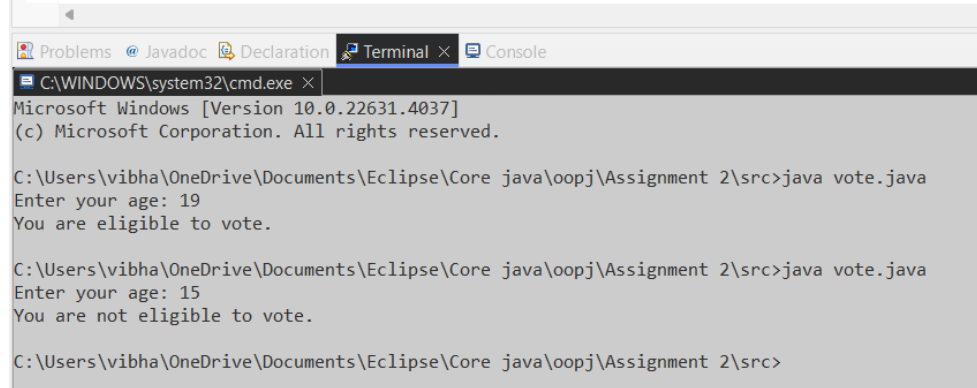
C:\Users\vibha\OneDrive\Documents\Eclipse\Core java\oopj\Assignment 2\src>java bmi.java
Enter weight in kg:
90
Enter height in meters:
1.8
BMI IS 27.78
You are overweight.

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

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

Code:

```
1 import java.util.Scanner;
2
3 public class vote
4 {
5     public static void main(String[] args)
6     {
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter your age: ");
9         int age = sc.nextInt();
10        if (age >= 18)
11        {
12            System.out.println("You are eligible to vote.");
13        }
14        else
15        {
16            System.out.println("You are not eligible to vote.");
17        }
18        sc.close();
19    }
20 }
```



The screenshot shows the Eclipse IDE interface. The top part displays the Java code for the 'vote' class. Below the code editor, the 'Terminal' tab is active, showing the command prompt. The user has run the command 'java vote.java' twice. In the first run, they entered '19' and the output was 'You are eligible to vote.'. In the second run, they entered '15' and the output was 'You are not eligible to vote.'. The console window title is 'C:\WINDOWS\system32\cmd.exe'.

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

```
1 import java.util.Scanner;
2 import java.time.Month;
3 public class seasons
4 {
5     public static void main(String[] args)
6     {
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter the month (1-12): ");
9         int month = sc.nextInt();
10        String monthname = null;
11        String season;
12        switch (month)
13        {
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!";
36                break;
37        }
38        monthname=Month.of(month).toString();
39        System.out.print("It's " + season + " season in " + monthname);
40        sc.close();
41    }
42 }
43
```

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.

```
1 import java.util.Scanner;
2 public class area {
3     public static void main(String[] args) {
4         Scanner sc = new Scanner(System.in);
5         System.out.println("Select a shape to calculate the area:");
6         System.out.println("1. Circle    2. Square");
7         System.out.println("3. Rectangle  4. Triangle ");
8         int choice = sc.nextInt();
9         switch (choice)
10        {
11            case 1: // Circle
12                System.out.print("Enter the radius of the circle: ");
13                double radius = sc.nextDouble();
14                double circleArea = Math.PI * radius * radius;
15                System.out.printf("The area of the circle is: %.2f\n", circleArea);
16                break;
17            case 2: // Square
18                System.out.print("Enter the side length of the square: ");
19                double side = sc.nextDouble();
20                double squareArea = side * side;
21                System.out.printf("The area of the square is: %.2f\n", squareArea);
22                break;
23            case 3: // Rectangle
24                System.out.print("Enter the length of the rectangle: ");
25                double length = sc.nextDouble();
26                System.out.print("Enter the width of the rectangle: ");
27                double width = sc.nextDouble();
28                double rectangleArea = length * width;
29                System.out.printf("The area of the rectangle is: %.2f\n", rectangleArea);
30                break;
31            case 4: // Triangle
32                System.out.print("Enter the base of the triangle: ");
33                double base = sc.nextDouble();
34                System.out.print("Enter the height of the triangle: ");
35                double height = sc.nextDouble();
36                double triangleArea = 0.5 * base * height;
37                System.out.printf("The area of the triangle is: %.2f\n", triangleArea);
38                break;
39            default:
40                System.out.println("Invalid choice! Please select a valid shape.");
41                break;
42        }
43        sc.close();
44    }
45 }
```

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>
```