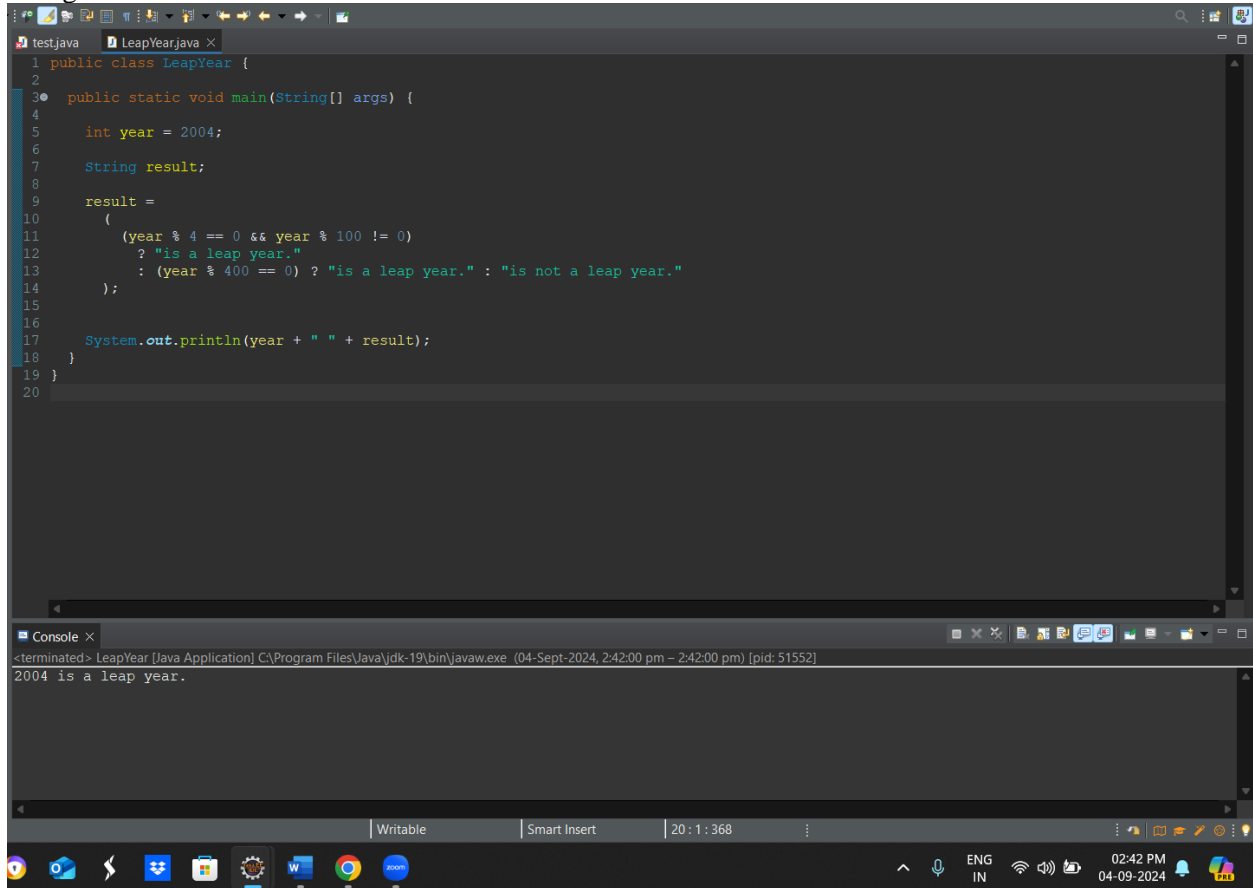


Assignment No- 2

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

Using if-else

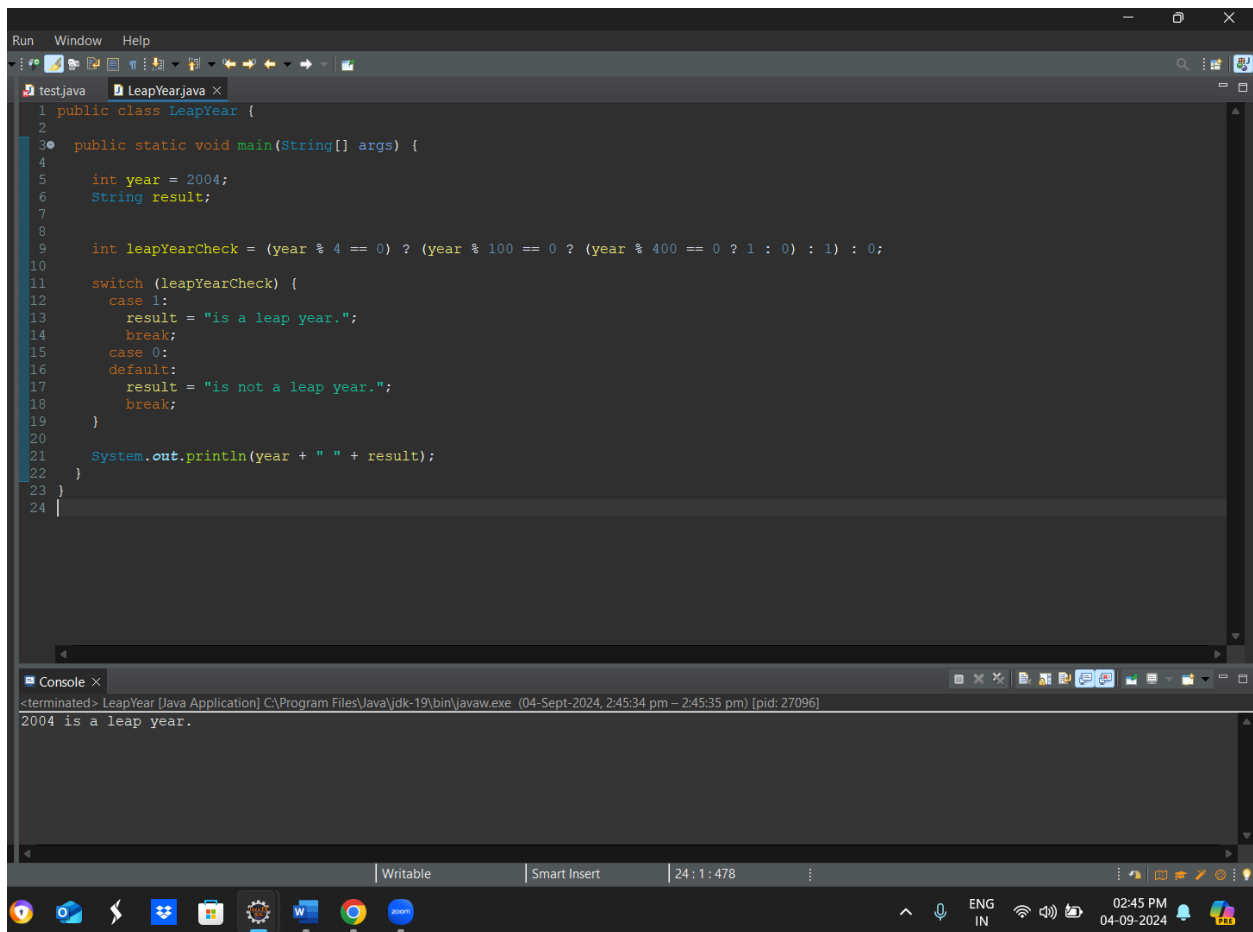


```
1 public class LeapYear {
2
3     public static void main(String[] args) {
4
5         int year = 2004;
6
7         String result;
8
9         result =
10            (
11                (year % 4 == 0 && year % 100 != 0)
12                ? "is a leap year."
13                : (year % 400 == 0) ? "is a leap year." : "is not a leap year."
14            );
15
16
17         System.out.println(year + " " + result);
18     }
19 }
20
```

Console Output:

```
<terminated> LeapYear [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 2:42:00 pm - 2:42:00 pm) [pid: 51552]
2004 is a leap year.
```

Using switch case



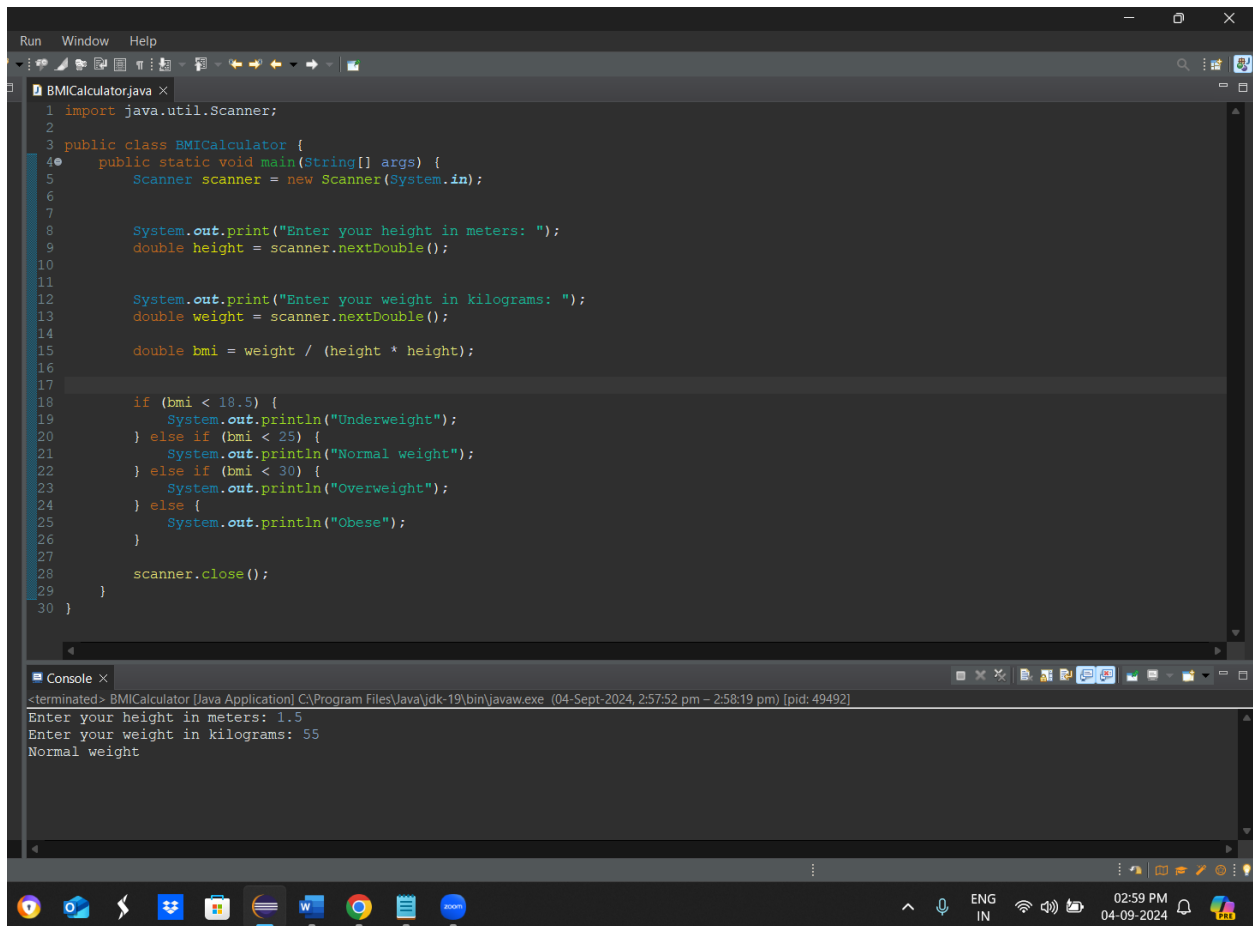
The screenshot shows an IDE window with a Java file named `LeapYear.java`. The code defines a `LeapYear` class with a `main` method that checks if the year 2004 is a leap year. The logic uses a ternary operator to calculate `leapYearCheck` based on divisibility by 4, 100, and 400. A `switch` statement then uses this value to set the `result` string. The console output shows the program executed successfully, printing "2004 is a leap year."

```
1 public class LeapYear {
2
3     public static void main(String[] args) {
4
5         int year = 2004;
6         String result;
7
8
9         int leapYearCheck = (year % 4 == 0) ? (year % 100 == 0 ? (year % 400 == 0 ? 1 : 0) : 1) : 0;
10
11        switch (leapYearCheck) {
12            case 1:
13                result = "is a leap year.";
14                break;
15            case 0:
16                default:
17                    result = "is not a leap year.";
18                    break;
19        }
20
21        System.out.println(year + " " + result);
22    }
23 }
24 |
```

Console Output:

```
<terminated> LeapYear [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 2:45:34 pm - 2:45:35 pm) [pid: 27096]
2004 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 into categories (underweight, normal weight, overweight, etc).



The screenshot shows an IDE window with a file named `BMICalculator.java`. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class BMICalculator {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter your height in meters: ");
8         double height = scanner.nextDouble();
9
10
11         System.out.print("Enter your weight in kilograms: ");
12         double weight = scanner.nextDouble();
13
14         double bmi = weight / (height * height);
15
16
17         if (bmi < 18.5) {
18             System.out.println("Underweight");
19         } else if (bmi < 25) {
20             System.out.println("Normal weight");
21         } else if (bmi < 30) {
22             System.out.println("Overweight");
23         } else {
24             System.out.println("Obese");
25         }
26
27         scanner.close();
28     }
29 }
30 }
```

Below the code editor is a console window showing the program's execution:

```
<terminated> BMICalculator [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 2:57:52 pm - 2:58:19 pm) [pid: 49492]
Enter your height in meters: 1.5
Enter your weight in kilograms: 55
Normal weight
```

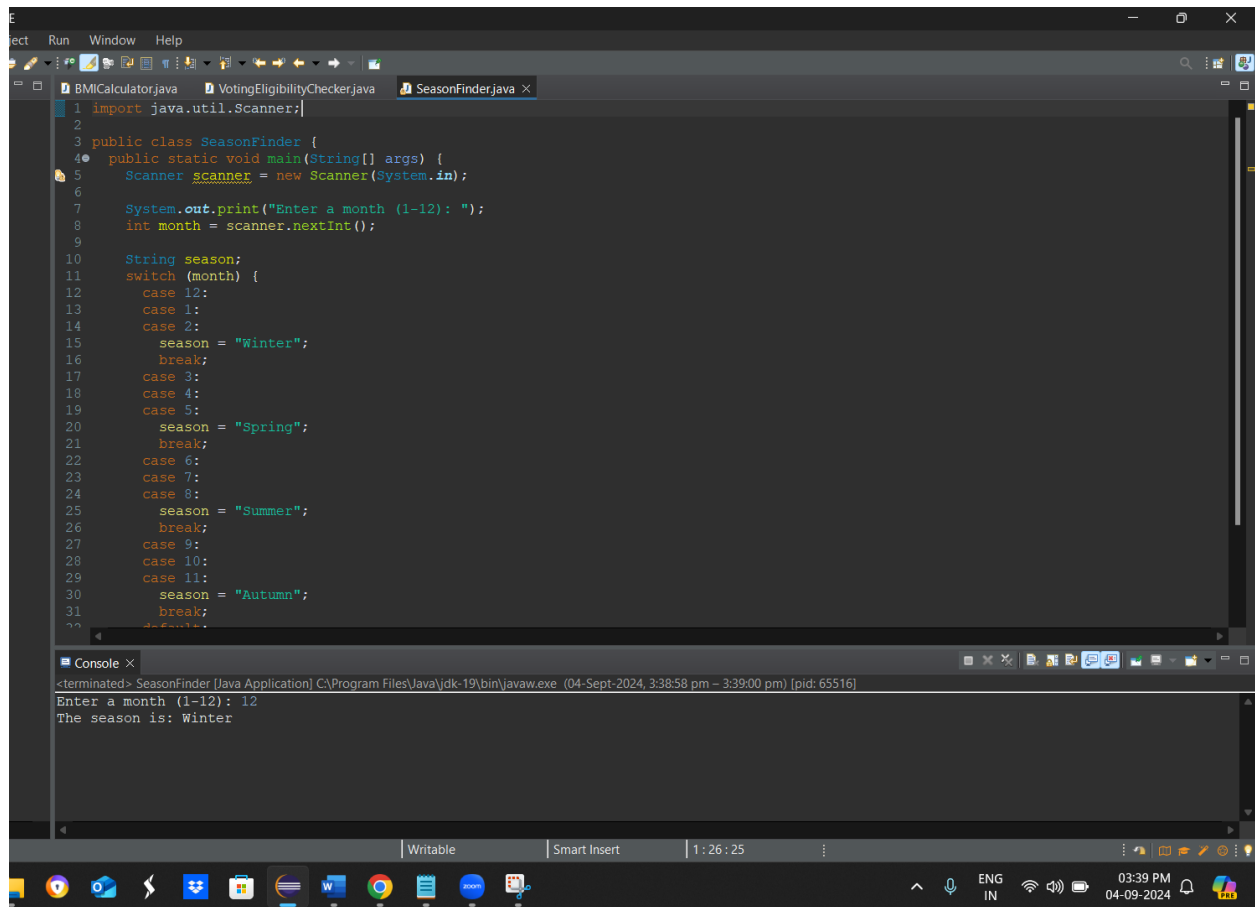
The Windows taskbar at the bottom shows the time as 02:59 PM on 04-09-2024.

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

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

Console X
<terminated> VotingEligibilityChecker [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 3:34:58 pm - 3:35:02 pm) [pid: 42812]
Enter your age: 18
You are eligible to vote!
```

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



The screenshot shows an IDE with three tabs: BMI Calculator.java, Voting Eligibility Checker.java, and SeasonFinder.java. The SeasonFinder.java tab is active, displaying the following code:

```
1 import java.util.Scanner;
2
3 public class SeasonFinder {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter a month (1-12): ");
8         int month = scanner.nextInt();
9
10        String season;
11        switch (month) {
12            case 12:
13            case 1:
14            case 2:
15                season = "Winter";
16                break;
17            case 3:
18            case 4:
19            case 5:
20                season = "Spring";
21                break;
22            case 6:
23            case 7:
24            case 8:
25                season = "Summer";
26                break;
27            case 9:
28            case 10:
29            case 11:
30                season = "Autumn";
31                break;
32            default:
33                season = "Invalid month";
34        }
35        System.out.println("The season is: " + season);
36    }
37 }
```

The Console window at the bottom shows the program's execution:

```
<terminated> SeasonFinder [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 3:38:58 pm - 3:39:00 pm) [pid: 65516]
Enter a month (1-12): 12
The season is: Winter
```

The Windows taskbar at the bottom shows the time as 03:39 PM on 04-09-2024.

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
3 public class ShapeAreaCalculator {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Select a shape (1. Circle, 2. Square, 3. Rectangle, 4. Triangle): ");
8         int shapeChoice = scanner.nextInt();
9
10        double area;
11
12        switch (shapeChoice) {
13            case 1: // Circle
14                System.out.print("Enter the radius: ");
15                double radius = scanner.nextDouble();
16                area = Math.PI * radius * radius;
17                break;
18            case 2: // Square
19                System.out.print("Enter the side length: ");
20                double sideLength = scanner.nextDouble();
21                area = sideLength * sideLength;
22                break;
23            case 3: // Rectangle
24                System.out.print("Enter the length: ");
25                double length = scanner.nextDouble();
26                System.out.print("Enter the width: ");
27                double width = scanner.nextDouble();
28                area = length * width;
29                break;
30            case 4: // Triangle
31                System.out.print("Enter the base: ");
32                double base = scanner.nextDouble();
33                System.out.print("Enter the height: ");
34                double height = scanner.nextDouble();
35                area = 0.5 * base * height;
36                break;
37        }
38        System.out.println("The area of the shape is: " + area);
39    }
40 }
```

Console

```
<terminated> ShapeAreaCalculator [Java Application] C:\Program Files\Java\jdk-19\bin\javaw.exe (04-Sept-2024, 3:41:14 pm - 3:41:37 pm) [pid: 80648]
Select a shape (1. Circle, 2. Square, 3. Rectangle, 4. Triangle): 3
Enter the length: 10
Enter the width: 20
The area of the shape is: 200.0
```