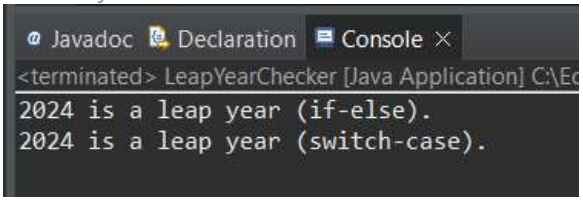
OOPJ ASS2 Soln (SW)

Thursday, September 12, 2024 2:58 PM

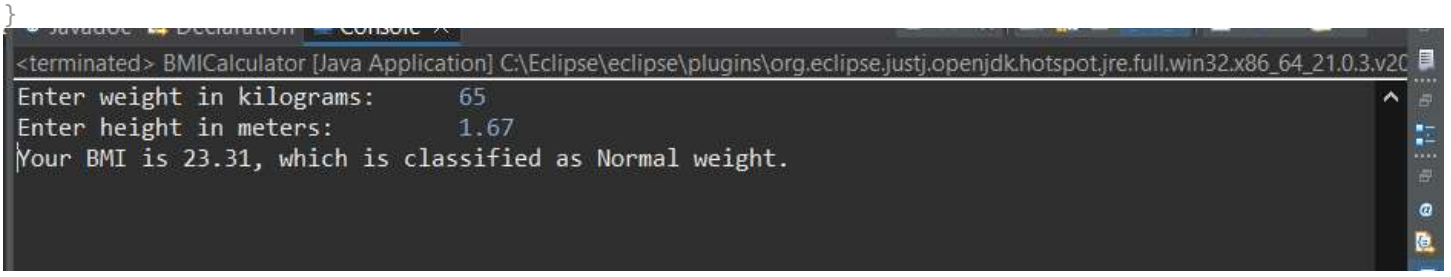
1)Write a program that checks if a given year is a leap year or not using both if-else and switch-case.

```
package assignment2SW;
import java.util.Scanner;
public class LeapYearChecker {
	public static void main(String[] args) {
		Scanner scanner = new Scanner(System.in);

		// Input year from user
		System.out.print("Enter a year: ");
		int year = scanner.nextInt();

		// Check using if-else
		if (isLeapYearIfElse(year)) {
			System.out.println(year + " is a leap year (if-else).");
		} else {
			System.out.println(year + " is not a leap year (if-else).");
		}

		// Check using switch-case
		switch (isLeapYearSwitch(year)) {
			case 1:
				System.out.println(year + " is a leap year (switch-case).");
				break;
			case 0:
				System.out.println(year + " is not a leap year (switch-
case).");
				break;
		}

		scanner.close();
	}

	// Method for leap year check using if-else
	private static boolean isLeapYearIfElse(int year) {
		if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
			return true;
		} else {
			return false;
		}
	}

	// Method for leap year check using switch-case
	private static int isLeapYearSwitch(int year) {
		boolean leapYear = (year % 4 == 0 && year % 100 != 0) || (year % 400
== 0);
		return leapYear ? 1 : 0;
	}
}
```



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).

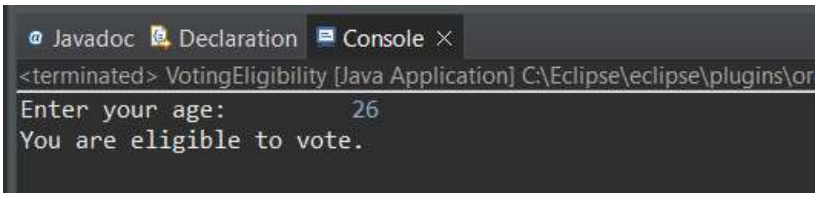
```
package assignment2SW;

import java.util.Scanner;

class BMICalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input weight and height from user
        System.out.print("Enter weight in kilograms: ");
        double weight = scanner.nextDouble();
        System.out.print("Enter height in meters: ");
        double height = scanner.nextDouble();

        // Calculate BMI
        double bmi = weight / (height * height);

        // Classify BMI
        String category;
        if (bmi < 18.5) {
            category = "Underweight";
        } else if (bmi < 24.9) {
            category = "Normal weight";
        } else if (bmi < 29.9) {
            category = "Overweight";
        } else {
            category = "Obesity";
        }

        // Output BMI and category
        System.out.printf("Your BMI is %.2f, which is classified as %s.%n", bmi,
category);

        scanner.close();
    }
}
```



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

```
package assignment2SW;

import java.util.Scanner;
```

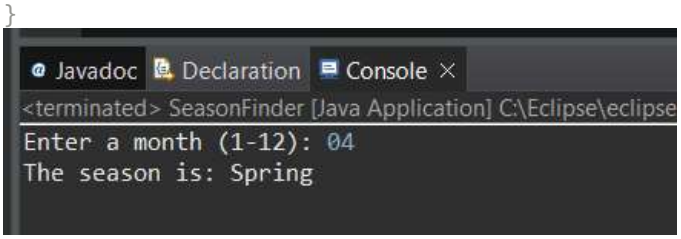
```java
class VotingEligibility {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input age from user
        System.out.print("Enter your age: ");
        int age = scanner.nextInt();

        // Check voting eligibility
        if (age >= 18) {
            System.out.println("You are eligible to vote.");
        } else {
            System.out.println("You are not eligible to vote.");
        }

        scanner.close();
    }
}
```



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

```java
package assignment2SW;

import java.util.Scanner;

class SeasonFinder {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input month from user
        System.out.print("Enter a month (1-12): ");
        int month = scanner.nextInt();

        // Determine season using switch-case
        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";
        }
```

```
        // Output season
        System.out.println("The season is: " + season);

        scanner.close();
    }
}
```



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.

```
package assignment2SW;

import java.util.Scanner;

class ShapeAreaCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input shape type
        System.out.println("Select a shape: Circle, Square, Rectangle, Triangle");
        String shape = scanner.nextLine().toLowerCase();

        double area = 0;

        switch (shape) {
            case "circle":
                System.out.print("Enter the radius: ");
                double radius = scanner.nextDouble();
                area = Math.PI * radius * radius;
                System.out.printf("The area of the circle is %.2f%n", area);
                break;
            case "square":
                System.out.print("Enter the side length: ");
                double side = scanner.nextDouble();
                area = side * side;
                System.out.printf("The area of the square is %.2f%n", area);
                break;
            case "rectangle":
                System.out.print("Enter the length: ");
                double length = scanner.nextDouble();
                System.out.print("Enter the width: ");
                double width = scanner.nextDouble();
                area = length * width;
                System.out.printf("The area of the rectangle is %.2f%n", area);
                break;
            case "triangle":
                System.out.print("Enter the base: ");
                double base = scanner.nextDouble();
                System.out.print("Enter the height: ");
                double height = scanner.nextDouble();
                area = 0.5 * base * height;
                System.out.printf("The area of the triangle is %.2f%n", area);
```

```
                break;
            default:
                System.out.println("Invalid shape.");
        }

        scanner.close();
    }
}
```