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CDAC AUGUST 2024 CDAC MUMBAI
Module 2: OOPJ
Assignment 1

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

```java
// 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 statement:

import java.util.Scanner;

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

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

        if (year % 4 == 0) {
            if (year % 100 == 0) {
                if (year % 400 == 0) {
                    System.out.println(year + " is a leap year.");
                } else {
                    System.out.println(year + " is not a leap year.");
                }
            } else {
                System.out.println(year + " is a leap year.");
            }
        } else {
            System.out.println(year + " is not a leap year.");
        }

        scanner.close();
    }
}
```

```java
// Using Switch-case

import java.util.Scanner;

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

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

        int divisibleBy4 = (year % 4 == 0) ? 1 : 0;
        int divisibleBy100 = (year % 100 == 0) ? 1 : 0;
        int divisibleBy400 = (year % 400 == 0) ? 1 : 0;

        switch (divisibleBy4) {
            case 1:
                switch (divisibleBy100) {
                    case 1:
                        switch (divisibleBy400) {
                            case 1:
                                System.out.println(year + " is a leap
year.");
                                break;
                            default:
                                System.out.println(year + " is not a leap
year.");
                        }
                        break;
                    default:
                        System.out.println(year + " is a leap year.");
                }
                break;
            default:
                System.out.println(year + " is not a leap year.");
        }

        scanner.close();
    }
}
```

Main.java

Share Run

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

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

Output Clear

```
java -cp /tmp/a2MrZoilCf/leapYear
Enter the year you want to choose:
2025
2025 is a leap year

=== Code Execution Successful ===
```

Main.java

Share Run

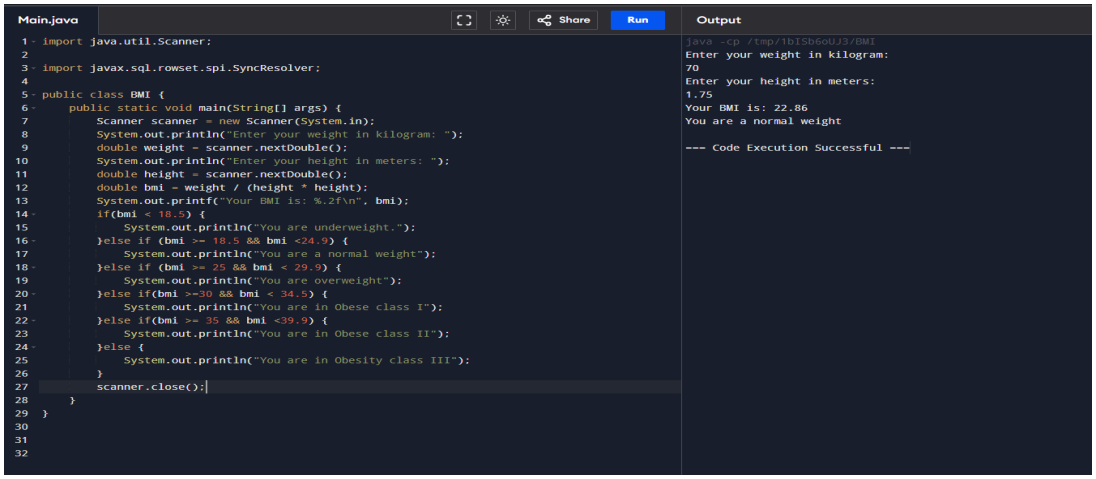
```java
// Using Switch Statement
import java.util.Scanner;
public class LeapYearSwitchCase {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a year: ");
        int year = scanner.nextInt();
        int divisibleBy4 = (year % 4 == 0) ? 1 : 0;
        int divisibleBy100 = (year % 100 == 0) ? 1 : 0;
        int divisibleBy400 = (year % 400 == 0) ? 1 : 0;
        switch (divisibleBy4) {
            case 1:
                switch (divisibleBy100) {
                    case 1:
                        switch (divisibleBy400) {
                            case 1:
                                System.out.println(year + " is a leap year.");
                                break;
                            default:
                                System.out.println(year + " is not a leap year.");
                        }
                        break;
                    default:
                        System.out.println(year + " is a leap year.");
                }
                break;
            default:
                System.out.println(year + " is not a leap year.");
        }
        scanner.close();
    }
}
```

Output

```
java -cp /tmp/8R1Ywp8GjL/LeapYearSwitch
Enter a year: 2025
2025 is not a leap year.

=== Code Execution Successful ===
```

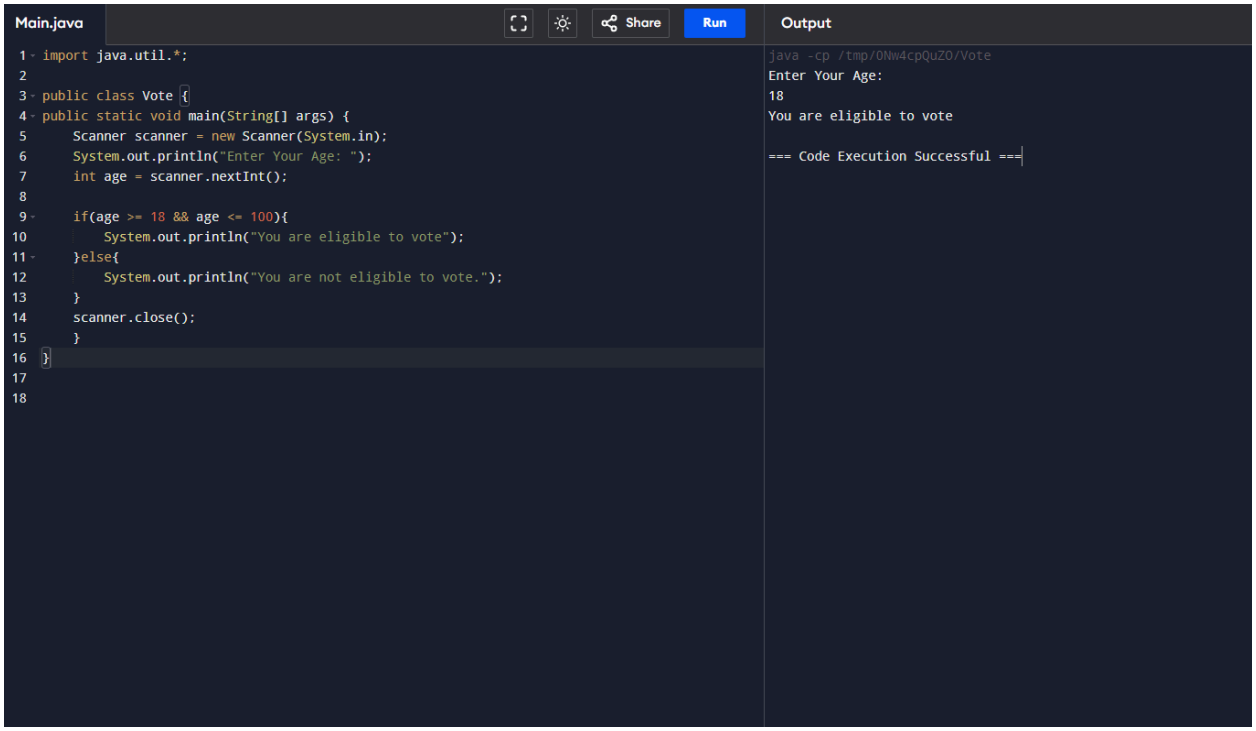
2) Implement a program that calculates the Body Mass Index (BMI) based on height and weight input using if-else to classify the BMI int categories (underweight, normal weight, overweight, etc

```
// BMI
import java.util.Scanner;
import javax.sql.rowset.spi.SyncResolver;
public class BMI {
    public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     System.out.println("Enter your weight in kilogram: ");
      double weight = scanner.nextDouble();
       System.out.println("Enter your height in meters: ");
       double height = scanner.nextDouble();
       double bmi = weight / (height * height);
       System.out.printf("Your 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 are a normal weight");
       }else if (bmi >= 25 && bmi < 29.9) {
           System.out.println("You are overweight");
       }else if(bmi >=30 && bmi < 34.5) {
           System.out.println("You are in Obese class I");
       }else if(bmi >= 35 && bmi <39.9) {
           System.out.println("You are in Obese class II");
       }else {
           System.out.println("You are in Obesity class III");
       }
       scanner.close();
    }
}
```



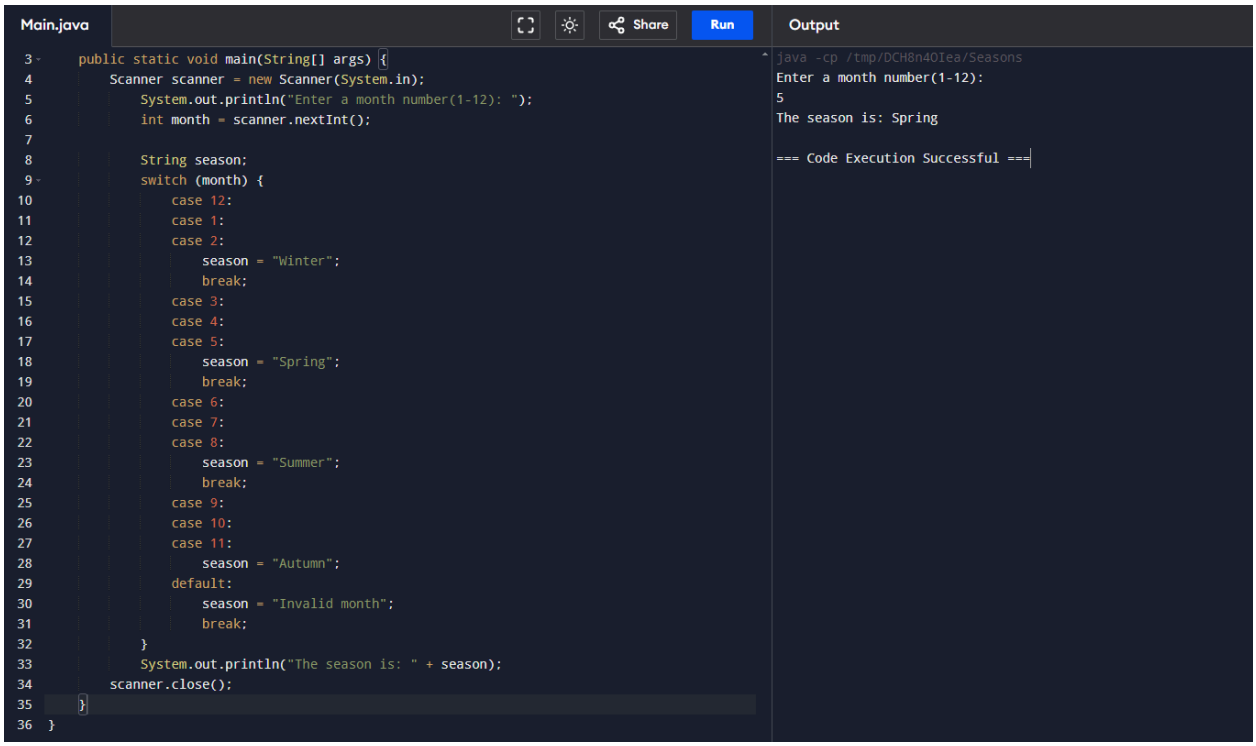
3)Write a program that checks if a person is eligible to vote based on their age

```
import java.util.*;

public class Vote {
public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.println("Enter Your Age: ");
    int age = scanner.nextInt();

    if(age >= 18 && age <= 100){
        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

```
import java.util.*;
public class Seasons {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
            System.out.println("Enter a month number(1-12): ");
            int month = scanner.nextInt();

            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";
                default:
                    season = "Invalid month";
                    break;
            }
            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.

```
import java.util.*;

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

        System.out.println("Select a shape to calculate the area:");
        System.out.println("1. Circle");
        System.out.println("2. Square");
        System.out.println("3. Rectangle");
        System.out.println("4. Triangle");

        System.out.print("Enter the number corresponding to your choice: ");
        int choice = scanner.nextInt();

        double area = 0;
        switch (choice) {
            case 1:
                System.out.print("Enter the radius of the circle: ");
```

```
            double radius = scanner.nextDouble();
            area = Math.PI * radius * radius;
            System.out.printf("The area of the circle is: %.2f\n", area);
            break;

        case 2:
            System.out.print("Enter the side length of the square: ");
            double side = scanner.nextDouble();
            area = side * side;
            System.out.printf("The area of the square is: %.2f\n", area);
            break;

        case 3:
            System.out.print("Enter the length of the rectangle: ");
            double length = scanner.nextDouble();
            System.out.print("Enter the width of the rectangle: ");
            double width = scanner.nextDouble();
            area = length * width;
            System.out.printf("The area of the rectangle is: %.2f\n", area);
            break;

        case 4:
            System.out.print("Enter the base of the triangle: ");
            double base = scanner.nextDouble();
            System.out.print("Enter the height of the triangle: ");
            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 choice. Please select a valid shape.");
            break;
      }
      scanner.close();
   }
}
```

Main.java

```java
import java.util.*;

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

        System.out.println("Select a shape to calculate the area:");
        System.out.println("1. Circle");
        System.out.println("2. Square");
        System.out.println("3. Rectangle");
        System.out.println("4. Triangle");

        System.out.print("Enter the number corresponding to your choice: ");
        int choice = scanner.nextInt();

        double area = 0;
        switch (choice) {
            case 1:
                System.out.print("Enter the radius of the circle: ");
                double radius = scanner.nextDouble();
                area = Math.PI * radius * radius;
                System.out.printf("The area of the circle is: %.2f\n", area);
                break;

            case 2:
                System.out.print("Enter the side length of the square: ");
                double side = scanner.nextDouble();
                area = side * side;
                System.out.printf("The area of the square is: %.2f\n", area);
                break;

            case 3:
                System.out.print("Enter the length of the rectangle: ");
                double length = scanner.nextDouble();
                System.out.print("Enter the width of the rectangle: ");
                double width = scanner.nextDouble();
                area = length * width;
                System.out.printf("The area of the rectangle is: %.2f\n", area);
                break;

            case 4:
                System.out.print("Enter the base of the triangle: ");
                double base = scanner.nextDouble();
                System.out.print("Enter the height of the triangle: ");
                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 choice. Please select a valid shape.");
                break;
        }
        scanner.close();
    }
}
```

Output

```
java -cp /tmp/BcZOr1sP0z/AreaCalculator
Select a shape to calculate the area:
1. Circle
2. Square
3. Rectangle
4. Triangle
Enter the number corresponding to your choice: 3
Enter the length of the rectangle: 5
Enter the width of the rectangle: 10
The area of the rectangle is: 50.00

=== Code Execution Successful ===
```