**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.

import java.util.Scanner;

public class LeapYearChecker {

public static boolean isLeapYear(int year) {

// Using if-else

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {

return true;

} else {

return false;

}

}

public static String leapYearSwitch(int year) {

// Using a switch-case equivalent with conditions

boolean isLeap = (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);

switch (isLeap ? 1 : 0) {

case 1:

return "Leap Year";

case 0:

return "Not a Leap Year";

default:

return "Unknown";

}

}

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter a year: ");

int year = scanner.nextInt();

// Check using if-else

if (isLeapYear(year)) {

System.out.println(year + " is a Leap Year (checked with if-else).");

} else {

System.out.println(year + " is Not a Leap Year (checked with if-else).");

}

// Check using switch-case equivalent

String result = leapYearSwitch(year);

System.out.println(year + " is " + result + " (checked with switch-case).");

scanner.close();

}

}

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).

import java.util.Scanner;

public class BMICalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Input weight in kilograms

System.out.print("Enter your weight (kg): ");

double weight = scanner.nextDouble();

// Input height in meters

System.out.print("Enter your height (m): ");

double height = scanner.nextDouble();

// Calculate BMI

double bmi = weight / (height \* height);

System.out.printf("Your BMI is: %.2f\n", bmi);

// Classify BMI

if (bmi < 18.5) {

System.out.println("Category: Underweight");

} else if (bmi >= 18.5 && bmi < 24.9) {

System.out.println("Category: Normal weight");

} else if (bmi >= 25 && bmi < 29.9) {

System.out.println("Category: Overweight");

} else {

System.out.println("Category: Obesity");

}

scanner.close();

}

}

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

import java.util.Scanner;

public class VotingEligibilityChecker {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Input age

System.out.print("Enter your age: ");

int age = scanner.nextInt();

// Check 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

import java.util.Scanner;

public class SeasonChecker {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Input month

System.out.print("Enter a month (1-12): ");

int month = scanner.nextInt();

// Determine the season using switch-case

String season;

switch (month) {

case 12: // December

case 1: // January

case 2: // February

season = "Winter";

break;

case 3: // March

case 4: // April

case 5: // May

season = "Spring";

break;

case 6: // June

case 7: // July

case 8: // August

season = "Summer";

break;

case 9: // September

case 10: // October

case 11: // November

season = "Autumn";

break;

default:

season = "Invalid month! Please enter a number between 1 and 12.";

}

// Output the season

System.out.println("The corresponding 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.Scanner;

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 your choice (1-4): ");

int choice = scanner.nextInt();

double area;

switch (choice) {

case 1: // Circle

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: // Square

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: // Rectangle

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: // Triangle

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 number between 1 and 4.");

}

scanner.close();

}

}