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.

Solution : - Using if - else

```
    import java.util.Scanner;
public class leapyear{
    public static void main(String[] args){
        System.out.print(" enter any year :");
        Scanner scanner = new Scanner(System.in);
        int year = scanner.nextInt();
        if(year % 4 == 0){
           if(year % 100 == 0){
              if(year % 400 == 0){
                System.out.println(" This year is a leap year");
             }
          else{
          System.out.println(" This year is not a leap year");
        }
        }
        else{
          System.out.println(" This year is not a leap year");
        }
        }
        else{
          System.out.println(" This year is not a leap year");
        }
    }
}
```

Output : -

```
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java leapyear
 enter any year :1600
 This year is a leap year
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java leapyear
 enter any year :2021
 This year is not a leap year
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```

Solution : - Using switch case

```
   import java.util.Scanner;
public class leapyear1{
    public static void main(String[] args){
        System.out.print(" enter any year :");
        Scanner scanner = new Scanner(System.in);
```

```
       int year = scanner.nextInt();
       switch ( year % 4 ) {
          case 0:
            switch ( year % 100 ) {
          case 0:
            switch ( year % 400 ) {
          case 0:
            System.out.println("this year is a leap year");
         break;
          default:
         System.out.println("this year is not leap year");
         }
         break;
    default:
         System.out.println(" this year is a leap year");
         }
         break;
    default:
         System.out.println(" this year is not leap year");
}
    }
}
```

Output : -

```
PS C:\CDAC_AUG_2024\Java Module\programs_VS> javac leapyear.java
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java leapyear1
 enter any year :1500
this year is not leap year
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java leapyear1
 enter any year :2012
 this year is  leap year
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```

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).

Solution : -

```
        import java.util.Scanner;
public class BMI {
 public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.print("Enter your height in meters : ");
        double height = scanner.nextDouble();

        System.out.print("Enter your weight in kilogram : ");
        double weight = scanner.nextDouble();

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

```
        System.out.printf("Your Body Mass Index is: %f ", +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();
    }
}
```

Output : -

```
Enter your height in meters : 1.45
Enter your weight in kilogram : 45
Your Body Mass Index is: 21.403092/n Category: Normal weight
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java BMI
Enter your height in meters : 1.75
Enter your weight in kilogram : 50
Your Body Mass Index is: 16.326531/n Category: Underweight
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```

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

```
   import java.util.Scanner;
public class vote{
public static void main(String[] args){
    System.out.println(" Enter your Age : ");
    Scanner scanner = new Scanner(System.in);
    int Age = scanner.nextInt();
     if(Age >= 18)
        {
            System.out.println("Eligible for voting");
        }

        else{
            System.out.println("not Eligible for voting");
        }
}
}
```

Output : -

```
PS C:\CDAC_AUG_2024\Java Module\programs_VS> javac vote.java
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java vote
 Enter your Age :
45
Eligible for voting
PS C:\CDAC_AUG_2024\Java Module\programs_VS> javac vote.java
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java vote
 Enter your Age :
12
not Eligible for voting
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```

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

Solution : -

```
  import java.util.Arrays;
import java.util.List;
import java.util.Scanner;
public class weather1{
public static void main(String[] args){
    System.out.print(" Enter any month you want :");
        Scanner scanner = new Scanner(System.in);
 String month = scanner.nextLine();
// String[] myArray = new String[] { "januvary" , "februvary" , "march" , "april"
, "may" , "june" , "july" , "august" , "september" , "octomber" , "november" ,
"december"};
 List<String> months = Arrays.asList( "December", "Januvary", "February",
"March", "April", "May", "June",
          "July", "August", "September", "October", "November");
  int index = months.indexOf(month);
  switch(index/3){
    case 0:
            System.out.println( " Winter Season " );
              break;
    case 1:
            System.out.println(" Summer Season " );
            break;
    case 2:
            System.out.println(" Spring Season " );
            break;
     case 3:
            System.out.println(" Autumn Season " );
            break;
     default :
            System.out.println(" enter valid month ");
}
}
}
```

Output : -

```
PS C:\CDAC_AUG_2024\Java Module\programs_VS> javac weather1.java
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java weather
 Enter any month you want :April
 summer
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```

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.

Solution : -

```
import java.util.Scanner;
import java.util.Arrays;
import java.util.List;
import java.lang.String;
public class shape{
    public static void main(String[] args){
        System.out.println(" Select a shape from given list :\" Circle\" , Square
, Rectangle , Triangle ");
        Scanner scanner = new Scanner(System.in);
        String shape = " " + scanner.nextLine() +" ";
        List<String> shapes = Arrays.asList( " Circle ", " Square ", " Rectangle
", " Triangle " );
        int index = shapes.indexOf(shape);
        double area;
       switch(index){
    case 0:
                System.out.println("Enter the radius of the circle: ");
                double radius = scanner.nextDouble();
                area = Math.PI * radius * radius;
                System.out.println("The area of the circle is: " + area);
                break;

    case 1:
                 System.out.println("Enter the side of the square:");
                 double side = scanner.nextDouble();
                 area = side * side;
                 System.out.println("The area of the square is: " + area);
                 break;

    case 2:
                  System.out.println("Enter the length and breadth of the
Rectangle:");
                  double length = scanner.nextDouble();
                  double breadth = scanner.nextDouble();
                  area = length * breadth;
                  System.out.println("The area of the  Rectangle is: " + area);
```

```
                break;

    case 3:
                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.println("The area of the triangle is: " + area);
                break;

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

Output : -

```
PS C:\CDAC_AUG_2024\Java Module\programs_VS> javac shape.java
PS C:\CDAC_AUG_2024\Java Module\programs_VS> java shape
 Select a shape from given list :" Circle" , Square , Rectangle , Triangle
Triangle
Enter the base of the triangle: 5
Enter the height of the triangle: 7
The area of the triangle is: 17.5
PS C:\CDAC_AUG_2024\Java Module\programs_VS>
```