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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.

Ans:

Using if-else:

```
import java.util.Scanner;
```

```
class Leapyearifelse {  
    public static void main(String args[]) {  
        Scanner scanner = new Scanner(System.in);  
        System.out.println("Enter a year");  
        int year = scanner.nextInt();  
        scanner.close();  
  
        if (isLeapyear(year)) {  
            System.out.println(year + " is a leap year");  
        } else {  
            System.out.println(year + " is not a leap year");  
        }  
    }  
  
    public static boolean isLeapyear(int year) {  
        if (year % 4 == 0) {  
            if (year % 100 == 0) {  
                return year % 400 == 0;  
            } else {  
                return true;  
            }  
        } else {  
            return false;  
        }  
    }  
}
```

```
J Leapyearifelse.java X J LeapYearSwitch.java 1 J BMI.java 1 •
J Leapyearifelse.java > ...
1 import java.util.Scanner;
2
3 class Leapyearifelse {
4     Run | Debug
5     public static void main(String args[]) {
6         Scanner scanner = new Scanner(System.in);
7         System.out.println(x:"Enter a year");
8         int year = scanner.nextInt();
9         scanner.close();
10
11         if (isleapyear(year)) {
12             System.out.println(year + " is a leap year");
13         } else {
14             System.out.println(year + " is not a leap year");
15         }
16     }
17
18     public static boolean isleapyear(int year) {
19         if (year % 4 == 0) {
20             if (year % 100 == 0) {
21                 return year % 400 == 0;
22             } else {
23                 return true;
24             }
25         } else {
26             return false;
27         }
28     }
29 }
30
```

```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java LeapYearSwitch
Enter a year:
2001
2001 is not a leap year.
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> |
```

Using Switch-case:

```
import java.util.Scanner;

public class LeapYearSwitch {
    public static void main(String args[]) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a year:");
        int year = scanner.nextInt();

        switch (isLeapYear(year)) {
            case 1:
                System.out.println(year + " is a leap year.");
                break;
            case 0:
                System.out.println(year + " is not a leap year.");
                break;
        }
    }

    public static int isLeapYear(int year) {
        int result;
        if (year % 4 == 0) {
            if (year % 100 == 0) {
                result = (year % 400 == 0) ? 1 : 0;
            } else {
                result = 1;
            }
        } else {
            result = 0;
        }
        return result;
    }
}
```

```
J LeapYearIfElse.java  J LeapYearSwitch.java 1 X  J BMI.java 1 ●
J LeapYearSwitch.java > LeapYearSwitch > isLeapYear(int)
1  import java.util.Scanner;
2
3  public class LeapYearSwitch {
4      Run | Debug
    public static void main(String args[]) {
5          Scanner scanner = new Scanner(System.in);
6          System.out.println("Enter a year:");
7          int year = scanner.nextInt();
8
9          switch (isLeapYear(year)) {
10             case 1:
11                 System.out.println(year + " is a leap year.");
12                 break;
13             case 0:
14                 System.out.println(year + " is not a leap year.");
15                 break;
16         }
17     }
18
19     public static int isLeapYear(int year) {
20         int result;
21         if (year % 4 == 0) {
22             if (year % 100 == 0) {
23                 result = (year % 400 == 0) ? 1 : 0;
24             } else {
25                 result = 1;
26             }
27         } else {
28             result = 0;
29         }
30         return result;
31     }
32 }
33
```

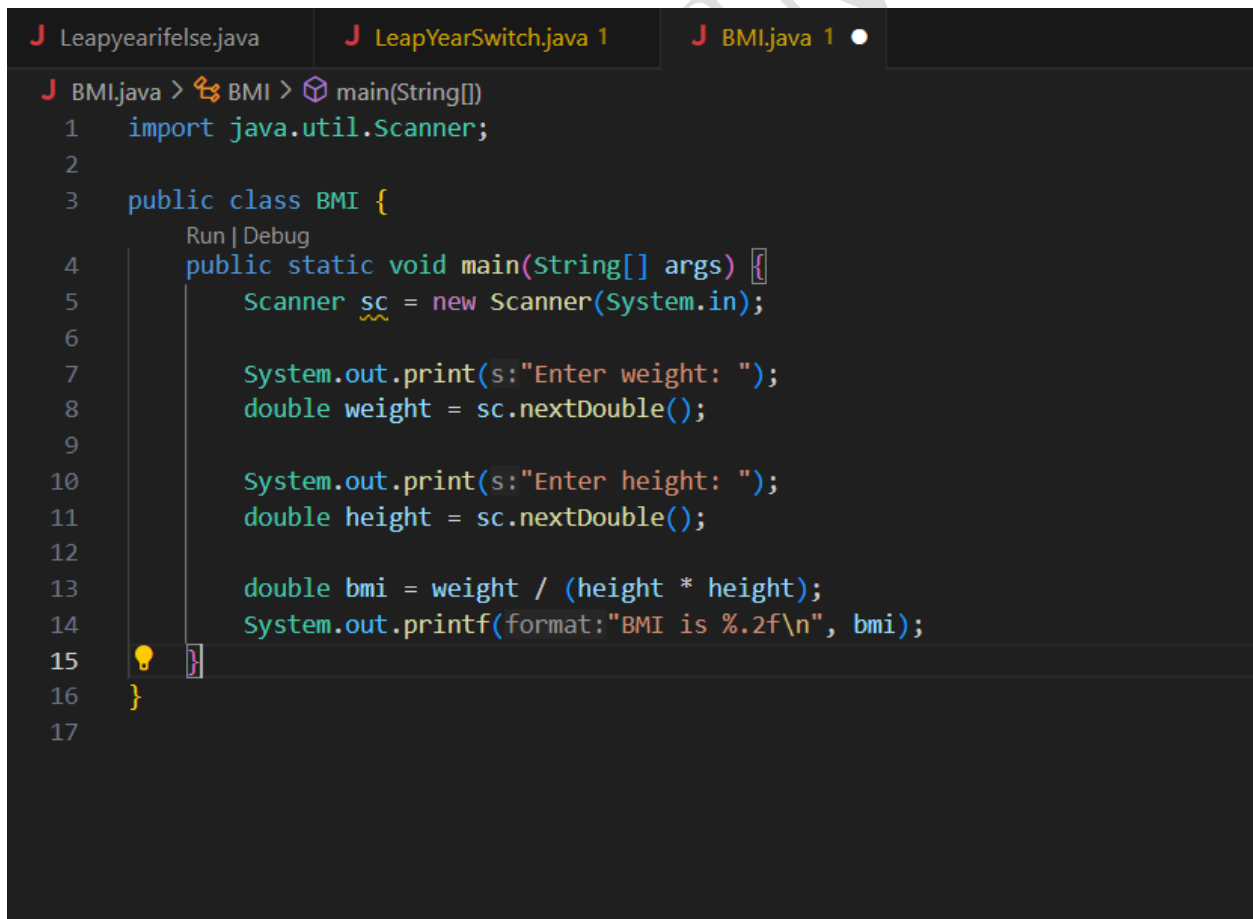
```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> javac LeapYearSwitch.java
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java LeapYearSwitch
Enter a year:
2000
2000 is a leap year.
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> |
```

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).

Ans:

```
import java.util.Scanner;
```

```
public class BMI {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        System.out.print("Enter weight: ");  
        double weight = sc.nextDouble();  
  
        System.out.print("Enter height: ");  
        double height = sc.nextDouble();  
  
        double bmi = weight / (height * height);  
        System.out.printf("BMI is %.2f\n", bmi);  
    }  
}
```



```
J Leapyearifelse.java J LeapYearSwitch.java 1 J BMI.java 1  
J BMI.java > BMI > main(String[])  
1 import java.util.Scanner;  
2  
3 public class BMI {  
    Run | Debug  
4     public static void main(String[] args) {  
5         Scanner sc = new Scanner(System.in);  
6  
7         System.out.print(s:"Enter weight: ");  
8         double weight = sc.nextDouble();  
9  
10        System.out.print(s:"Enter height: ");  
11        double height = sc.nextDouble();  
12  
13        double bmi = weight / (height * height);  
14        System.out.printf(format:"BMI is %.2f\n", bmi);  
15    }  
16 }  
17
```

```
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> javac BMI.java
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java BMI
Enter weight: 77
Enter height: 6.2
BMI is 2.00
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> █
```

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

Ans:

```
import java.util.Scanner;
public class Age
{
    public static void main(String args[]){
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the Age: ");
        int age = scanner.nextInt();
        if (age >= 18) {
            System.out.println("Eligible to vote");
        }
        else{
            System.out.println("Not Eligible to vote");
        }
    }
}
```

```
J LeapYearIfElse.java  J LeapYearSwitch.java 1  J BMI.java 1  J Age.java 1 x
J Age.java > Age
1  import java.util.Scanner;
2  public class Age
3  {
4      public static void main(String args[]){
5          Scanner scanner = new Scanner(System.in);
6          System.out.println(x:"Enter the Age: ");
7          int age = scanner.nextInt();
8          if (age >= 18) {
9              System.out.println(x:"Eligible to vote");
10         }else{
11             System.out.println(x:"Not Eligible to vote");
12         }
13     }
14 }
15
16
17
18
19
```

```
PROBLEMS 3  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> javac Age.java
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java Age
Enter the Age:
19
Eligible to vote
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> |
```

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

Ans:

```
import java.util.Scanner;
public class Seasons {

    public static void main(String args[]){
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a month : (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";
                break;
            default:
                season = "Invalid month";
                break;
        }
        System.out.println("The Season is:" +season);
    }
}
```



```

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

```

PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

PS C:\Users\Sumit\Downloads\OOJP Assignment 2> javac Seasons.java
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java Seasons
Enter a month : (1-12)
11
The Season is:Autumn
PS C:\Users\Sumit\Downloads\OOJP Assignment 2>

```

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.

Ans:

```
import java.util.Scanner;
public class Shape {
    public static void main(String args[]){
        Scanner scanner = new Scanner(System.in);
        System.out.println("Select the Shape");
        System.out.println("1. Circle");
        System.out.println("2. Square");
        System.out.println("3. Rectangle");
        System.out.println("4. Triangle");
        int choice = scanner.nextInt();
        switch(choice){
            case 1:
                System.out.println("Enter the radius of the Circle :");
                double radius = scanner.nextDouble();
                double circlearea = 3.14 * radius * radius;
                System.out.println("The area of the Circle is " +circlearea);
                break;
            case 2:
                System.out.println("Enter the side of Square:");
                double side = scanner.nextDouble();
                double Squarearea = side * side;
                System.out.println("The Area of a Square is : " +Squarearea);
                break;
            case 3:
                System.out.println("Enter the height and width of a Rectangle :");
                double height = scanner.nextDouble();
                double width = scanner.nextDouble();
                double Rectanglearea = height * width;
                System.out.println("The area of a Rectangle is: " +Rectanglearea);
                break;
            case 4:
                System.out.println(" Enter the base and height of the Triangle: ");
                double base = scanner.nextDouble();
                double THeight = scanner.nextDouble();
                double areatriangle = 0.5 * base * THeight;
                System.out.println("The area of a triangle is: " +areatriangle);
                break;
            default:
                System.out.println("Please select a valid Shape.");
                break;
        }
        scanner.close();
    }
}
```

```
J Leapyearifelse.java J LeapYearSwitch.java 1 J BMI.java 1 J Age.java 1 J Seasons.java 1 J Shape.java ●
J Shape.java > Shape
1 import java.util.Scanner;
2 public class Shape {
    Run | Debug
3     public static void main(String args[]){
4         Scanner scanner = new Scanner(System.in);
5         System.out.println("Select the Shape");
6         System.out.println("1. Circle");
7         System.out.println("2. Square");
8         System.out.println("3. Rectangle");
9         System.out.println("4. Triangle");
10        int choice = scanner.nextInt();
11        switch(choice){
12            case 1:
13                System.out.println("Enter the radius of the Circle :");
14                double radius = scanner.nextDouble();
15                double circlearea = 3.14 * radius * radius;
16                System.out.println("The area of the Circle is" +circlearea);
17                break;
18            case 2:
19                System.out.println("Enter the side of Square:");
20                double side = scanner.nextDouble();
21                double Squarearea = side * side;
22                System.out.println("The Area of a Square is :" +Squarearea);
23                break;
24            case 3:
25                System.out.println("Enter the height and width of a Rectangle :");
26                double height = scanner.nextDouble();
27                double width = scanner.nextDouble();
28                double Rectanglearea = height * width;
29                System.out.println("The area of a Rectangle is:" +Rectanglearea);
30                break;
31            case 4:
32                System.out.println("Enter the base and height of the Triangle: ");
33                double base = scanner.nextDouble();
34                double THeight = scanner.nextDouble();
35                double areatriangle = 0.5 * base * THeight;
36                System.out.println("The area of a triangle is: " +areatriangle);
```

```
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> javac Shape.java
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> java Shape
Select the Shape
1. Circle
2. Square
3. Rectangle
4. Triangle
2
Enter the side of Square:
18
The Area of a Square is :324.0
PS C:\Users\Sumit\Downloads\OOJP Assignment 2> |
```