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Assignment 2:

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

By using if-else:

```
import java.util.*;
class Prg1
	{
		public static void main(String args[])
		{
		System.out.println("Enter the year: ");
		Scanner sc= new Scanner(System.in);
		int year=sc.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:

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg1.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg1
Enter the year:
1200
1200is a leap year

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg1
Enter the year:
2024
2024is a leap year

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg1
Enter the year:
2023
2023is not a leap year

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg1
Enter the year:
100
100is not a leap year
```

By using switch case:

```
import java.util.*;
class Prg2
{
	public static void main(String args[])
	{
		System.out.println("Enter the year: ");
		Scanner sc=new Scanner(System.in);
		int year= sc.nextInt();
		switch(year%400)
		{
			case 0:
				System.out.println(year + " is a leap year");
				break;

				default:
		switch(year%4)
		{
			case 0:
				switch(year%100)
				{
					case 0:
					System.out.println(year + "not a leap year");
					break;
					default:
					System.out.println("Leap year");
					break;
				}
				break;
				default:
				System.out.println("Not a leap year");
				break;
		}
		break;
	}
	}
}
```

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg2.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg2
Enter the year:
2000
2000is a leap year

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg2
Enter the year:
2022
Not a leap year
```

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).

```
import java.util.*;
class Prg3
{
	public static void main( String args[])
	{
		float height, weight;
		double BMI;
		System.out.println("Enter the height");
		Scanner sc = new Scanner(System.in);
		height= sc.nextFloat();
		System.out.println("Enter the weight");
		weight= sc.nextFloat();
		BMI= weight / Math.pow(height, 2);

		if (BMI<18.5)
			System.out.println("Person with BMI " + BMI + " is underweight");
		else if (BMI>=18.5 && BMI<24.9)
			System.out.println("Person with BMI " + BMI + " is healthy");
		else if (BMI>=30)
			System.out.println("Person with BMI " + BMI + " suffering from obesity");
	}
}
```

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg3
Enter the height
5.2
Enter the weight
60
Person with BMI 2.2189350740227076is underweight
```

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg3.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg3
Enter the height
1.79
Enter the weight
70
Person with BMI 21.84700945150345 is healthy
```

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

```
import java.util.*;
class Prg4
{
	public static void main(String args[])
	{
		int age ;
		System.out.println("Enter the age ");
		Scanner sc=new Scanner(System.in);
		age=sc.nextInt();
		if (age>=18)
			System.out.println("Person is eligible for voting");
		else
			System.out.println("Person is not eligible for voting");
	}
}
```

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg4.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg4
Enter the age
18
Person is eligible for voting

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg4
Enter the age
20
Person is eligible for voting

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg4
Enter the age
17
Person is not eligible for voting
```

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.*;
class Prg5
{
	public static void main(String args[])
	{
		String season;
		System.out.println("Enter any month (1-12)");
		Scanner sc=new Scanner(System.in);
		int month= sc.nextInt();
		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";
		}
		System.out.println("The entered month is in the " + season);
	}
}
```

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg5.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg5
Enter any month (1-12)
1
The entered month is in the Winter

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>13
'13' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg5
Enter any month (1-12)
13
The entered month is in the Invalid month
```

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.*;
import java.lang.*;
class Prg6
{
	public static void main(String args[])
	{
		String shape;
		System.out.println("Enter the shape: ");
		Scanner sc= new Scanner(System.in);
		shape=sc.nextLine();
		switch(shape)
		{

		case "Circle":
		int radius;
		double Area;
		System.out.println("The selected shape is Circle");
		System.out.println("Enter the radius: ");
		//Scanner sc= new Scanner(System.in);
		radius=sc.nextInt();
		Area=3.14*Math.pow(radius, 2);
		System.out.println("Area of the Circle: " + Area);
		break;

		case "Rectangle":
		float  length, breadth;
```

```
                double Area1;
                System.out.println("The selected shape is Rectangle");
                System.out.println("Enter length: ");
                //Scanner sc= new Scanner(System.in);
                length=sc.nextFloat();
                System.out.println("Enter breadth: ");
                breadth=sc.nextFloat();
                Area1= length * breadth;
                System.out.println("Area of the Rectangle: " + Area1);
                break;

                case "Square" :
                float side;
                double Area2;
                System.out.println("The selected shape is Square");
                System.out.println("Enter the side: ");
                side=sc.nextFloat();
                Area2= Math.pow(side, 2);
                System.out.println("Area of the square: " + Area2);
                break;

                case "Triangle" :
                float base, height;
                double Area3;
                System.out.println("The selected shape is Triangle");
                System.out.println("Enter the base: ");
                //Scanner sc= new Scanner(System.in);
                base= sc.nextFloat();
                System.out.println("Enter the height: ");
                height= sc.nextFloat();
                Area3= 0.5*base*height;
                System.out.println("Area of the triangle: " + Area3);
                break;

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

```
C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Javac Prg6.java

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg6
Enter the shape:
Circle
The selected shape is Circle
Enter the radius:
3
Area of the Circle: 28.26

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg6
Enter the shape:
Rectangle
The selected shape is Rectangle
Enter length:
4
Enter breadth:
2
Area of the Rectangle: 8.0

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg6
Enter the shape:
Square
The selected shape is Square
Enter the side:
3
Area of the square: 9.0

C:\Users\PRASHANSA\Desktop\Java Notes\Assignment_Solutions>Java Prg6
Enter the shape:
ABC
Invalid shape
```