DAY 2

1. Introduction to Control Flow Statements

2. If-Else Statement

3. Switch Statement

4. Loops in Java

4.1 For Loop

4.2 While Loop

4.3 Do-While Loop

Questions:

Write a program that takes a year from the user and checks if it is a leap year. A year is a leap year if:

- It is divisible by 4.
- But not divisible by 100, unless it is also divisible by 400.

Write a program that calculates the grade of a student based on their marks. The grading criteria are as follows:

- 90-100: A+
- 80-89: A
- 70-79: B+
- 60-69: B
- 50-59: C
- Below 50: Fail

Write a program that takes the lengths of three sides of a triangle and determines if the triangle is:

- Equilateral (all sides are equal),
- Isosceles (two sides are equal),
- Scalene (no sides are equal),
- or if the sides do not form a valid triangle.

Switch :

Write a program that takes two numbers and an operator (+, -, *, /, %) from the user and performs the corresponding arithmetic operation using a switch statement. Handle invalid operators.

Write a program that takes a number (1-7) from the user and prints the corresponding day of the week. If the input is outside the range, print "Invalid day number.

Write a program that takes a letter grade (`A`, `B`, `C`, `D`, `F`) from the user and prints the corresponding grade description:

- `A`: "Excellent"
- `B`: "Good"
- `C`: "Average"
- `D`: "Below Average"
- `F`: "Fail" Handle invalid grade input.

Write a program that implements a menu-driven calculator using a switch statement. The program should display a menu of options, take user input for the operation they want, and perform the corresponding arithmetic operation on two numbers. Handle invalid menu selections.

Loops

Print a full pyramid of n rows.

```
    *
   * *
  * * *
 * * * *
* * * * *
```

Print an inverted full pyramid of n rows.

```
* * * * *
 * * * *
  * * *
   * *
    *
```

Print a diamond shape pattern for n rows.

```
    *
   ***
  *****
 *******
*********
 *******
  *****
   ***
    *
```

Print Floyd's Triangle for n rows.

```
1
2 3
4 5 6
7 8 9 10
```