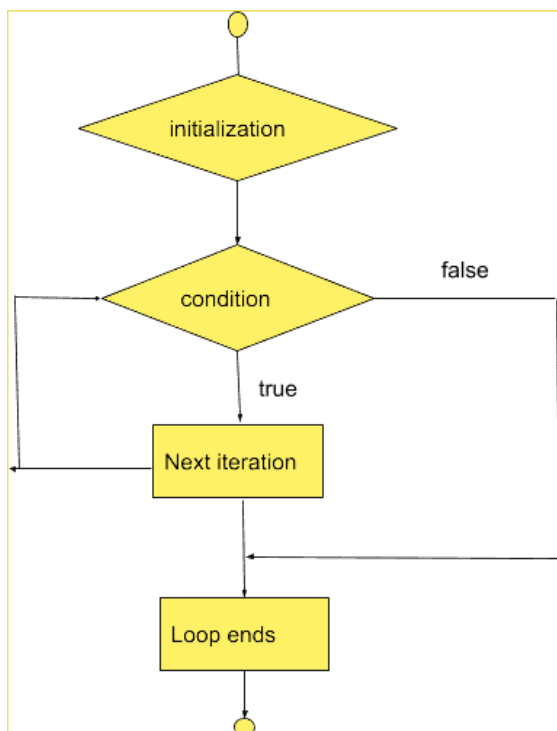# 08-For Loop

A for loop is a control flow structure in programming that iterates over a sequence of elements, such as a range of numbers, items in a list, or characters in a string. It is an entry-controlled loop, meaning it determines the number of iterations before entering the loop. The for loop provides a concise way of writing the loop control structure in a single line, unlike other loops where initialization, condition, and increment/decrement steps are specified separately.

Syntax of For Loop:

for (initialization; condition; update) {

   // code block to be executed

}

- **Initialization**: This step sets the starting value of the loop control variable.

- **Condition**: This is the test condition that must be true for the loop to continue executing.

- **Update**: This modifies the loop control variable after each iteration.

Example and Output

Code Example:

public class Hello {

```java
public static void main(String[] args) {

    // Example 1: Printing "Hi" with indices

    for (int i = 0; i <= 4; i++) {

        System.out.println("Hi " + i);

    }
```

```
Output                                    Clear

java -cp /tmp/6B1TpL7Fdp/Hello
Hi 0
Hi 1
Hi 2
Hi 3
Hi 4
```

```java
    // Example 2: Nested for loops to display days and working hours

    for (int i = 1; i <= 7; i++) {

        System.out.println("Day " + i);

        for (int j = 1; j <= 9; j++) {

            System.out.println(" " + (j + 8) + " - " + (j + 9));

        }

    }
```

```
Output

java -cp /tmp/6It4hcOTqg/Hello
Day 1
  9 - 10
 10 - 11
 11 - 12
 12 - 13
 13 - 14
 14 - 15
 15 - 16
 16 - 17
 17 - 18
Day 2
  9 - 10
 10 - 11
 11 - 12
 12 - 13
 13 - 14
 14 - 15
 15 - 16
 16 - 17
 17 - 18
Day 3
  9 - 10
 10 - 11
 11 - 12
 12 - 13
 13 - 14
 14 - 15
 15 - 16
 16 - 17
 17 - 18
Day 4
  9 - 10
 10 - 11
 11 - 12
 12 - 13
 13 - 14
 14 - 15
 15 - 16
 16 - 17
 17 - 18
Day 5
  9 - 10
 10 - 11
 11 - 12
 12 - 13
 13 - 14
 14 - 15
 15 - 16
 16 - 17
 17 - 18

== Code Execution Successful ==
```

// Example 3: For loop with initialization outside the loop

```java
int i = 1;

for (; i <= 5;) {

    System.out.println("DAY " + i);

    i++;

    }

}
```

Output

Clear

```
java -cp /tmp/BJGViLGiMR/Hello
```
DAY 1
DAY 2
DAY 3
DAY 4
DAY 5