Faculty : Mr. Tarek Mizan
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Class Timing: ST 1:00 PM – 2:30 PM (LIB-611)
Topic: Loops, Jump

Objective

1. To learn about Loops in java (while, for, do-while, foreach).
2. To learn to use Jump (continue, break)

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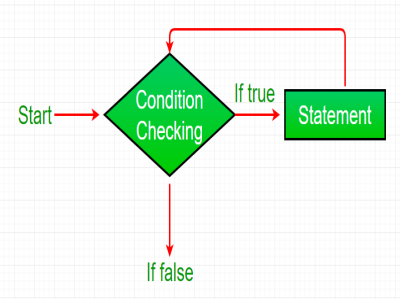
while loop:

A while loop is a control flow statement that allows code to be executed repeatedly based on a given Boolean condition. The while loop can be thought of as a repeating if statement.

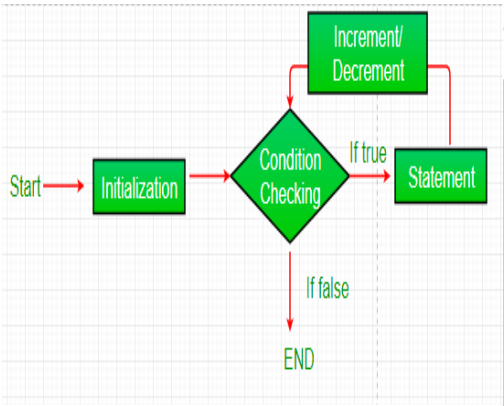



```
Syntax :

while (boolean condition)
{
loop statements...
}
```

LooppDemo1.java

```java
class LooppDemo1 {
    public static void main(String args[])
    {
        int x = 1, sum = 0;

        // Exit when x becomes greater than 10
        while (x <= 10) {
            // summing up x
            sum = sum + x;

            // Increment the value of x for next iteration
            x++;
        }
        System.out.println("Summation: " + sum);
    }
}
```

for loop: for loop provides a concise way of writing the loop structure. Unlike a while loop, a for statement consumes the initialization, condition and increment/decrement in one line thereby providing a shorter, easy to debug structure of looping.

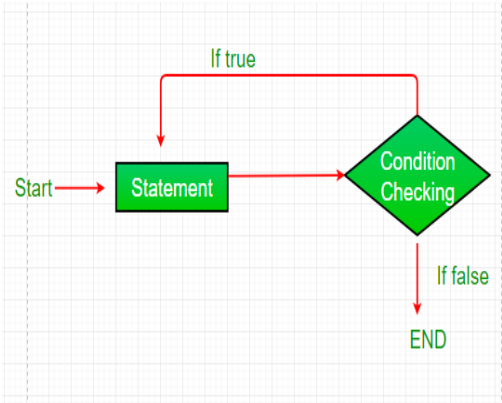



```
    Syntax :

    for (initialization condition; testing
condition;

increment/decrement)
    {
        statement(s)
    }
```

LooppDemo2.java

```
public class LooppDemo2 {
    public static void main(String[] args)
    {
        // prints 1 - 10
        for (int i = 1; i <= 10; i++) {
            System.out.println(i);
        }
    }
}
```

do while: do while loop is similar to while loop with only difference that it checks for condition after executing the statements, and therefore is an example of Exit Control Loop.




```
    Syntax :

    do
    {
        statements..
    }
    while (condition);
```

LooppDemo3.java

```
public class LooppDemo3 {
    // Main driver method
    public static void main(String args[])
    {

        // Declaring and initialization expression
```

```
        int i = 1;

        // Do-while loop
        do {

            // Body od do-while loop
            // Print statement
            System.out.println("Hello World");

            // Update expression
            i++;
        }

        // Test expression
        while (i < 6);
    }
}
```

for-each: For-each is another array traversing technique like for loop, while loop, do-while loop introduced in Java5.

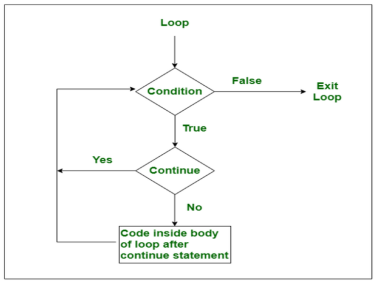
```
    Syntax :

    for (type var : array)
    {
        statements using var;
    }
```

LooppDemo4.java

```
public class LooppDemo4 {
  public static void main(String[] args) {
    String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};
    for (String i : cars) {
      System.out.println(i);
    }
  }
}
```

continue:

1. In the case of for loop, the continue keyword force control to jump immediately to the update statement.
2. Whereas in the case of a while loop or do-while loop, control immediately jumps to the Boolean expression.




```
Syntax :

continue;
```

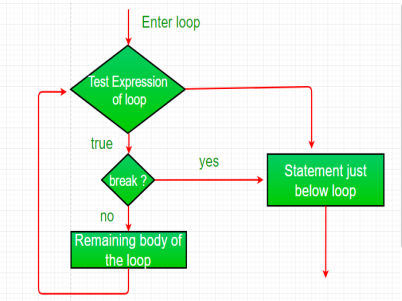
LooppDemo5.java

```java
public class LooppDemo5 {

    // Main driver method
    public static void main(String args[])
    {
        // For loop for iteration
        for (int i = 0; i <= 15; i++) {

            // Check condition for continue
            if (i == 10 || i == 12) {

                // Using continue statement to skip the
                // execution of loop when i==10 or i==12
                continue;
            }
            // Printing elements to show continue statement
            System.out.print(i + " ");
        }
    }
}
```

break:

1. Terminate a sequence in a switch statement (discussed above).
2. To exit a loop.
3. Used as a “civilized” form of goto.

Note: Break, when used inside a set of nested loops, will only break out of the innermost loop.




```
Syntax :

break;
```

LooppDemo6.java

```
public class LooppDemo6 {

    // Main driver method
    public static void main(String args[])
    {
        // Initially loop is set to run from 0-9
        for (int i = 0; i < 10; i++) {
            // terminate loop when i is 5.
            if (i == 5)
                break;

            System.out.println("i: " + i);
        }
        System.out.println("Loop complete.");
    }
}
```

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Tasks:

1. Write down a program using while loop that will print all factors of a number n and the total number of factors of it. N will be input to your program. For example if N = 6, it has four factors namely 1, 2, 3, 6 and it has total 4 factors. So the output will be as follows:

```
Sample Input/Output 1:    Sample Input/Output 2:
Enter N: 6                Enter N: 15
6 has total 4 factors.    15 has total 4 factors.
```

2. Print summation of the following series: 1 + 1/2 + 1/3 + 1/4 + ... + 1/n where integer n will be input to your program. Use for loop to solve the problem.

```
Sample Input/Output 1:    Sample Input/Output 2:
N = 3                     N = 5
Summation = 1.83          Summation = 2.28
```

3. Write a program that will read N postitve numbers untill 0 or a negetive number is inputed from keybord. using a do-loop and will display their sum.

```
Sample Input/Output 1:    Sample Input/Output 2:
Inputs : 1.5 5.5 3 0      Inputs :  -5
Sum :  10.00              Sum :  0.00
```