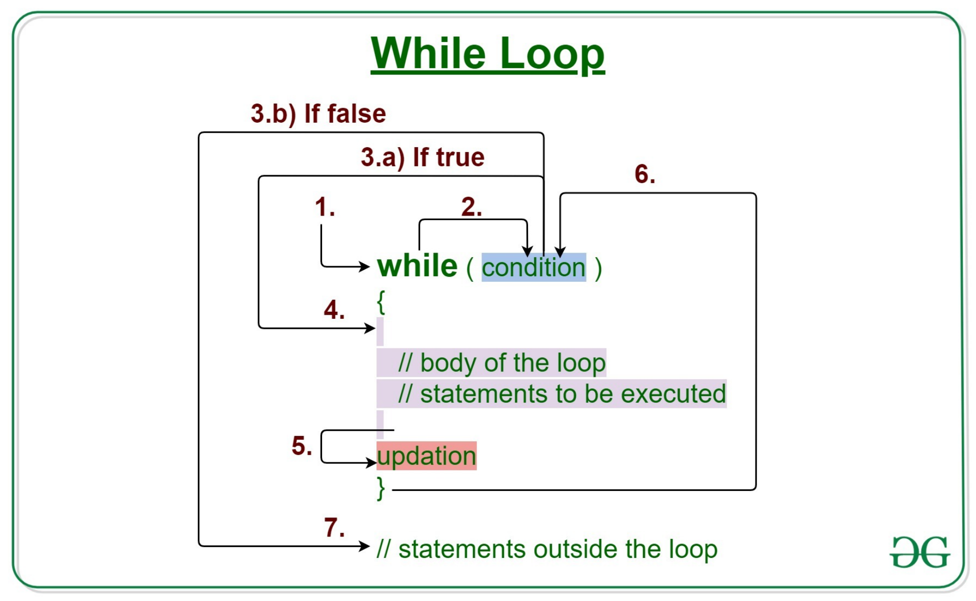
Java while loop with Examples

Difficulty Level : Easy Last Updated : 17 Feb, 2021

Loops in Java come into use when we need to repeatedly execute a block of statements.

Java 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 (test_expression)
{
   // statements

  update_expression;
}
```

The various **parts of the While loop** are:

1. **Test Expression:** In this expression we have to test the condition. If the condition evaluates to true then we will execute the body of the loop and go to update expression. Otherwise, we will exit from the while loop.
   Example:

   ```
   i <= 10
   ```

2. **Update Expression**: After executing the loop body, this expression increments/decrements the loop variable by some value.

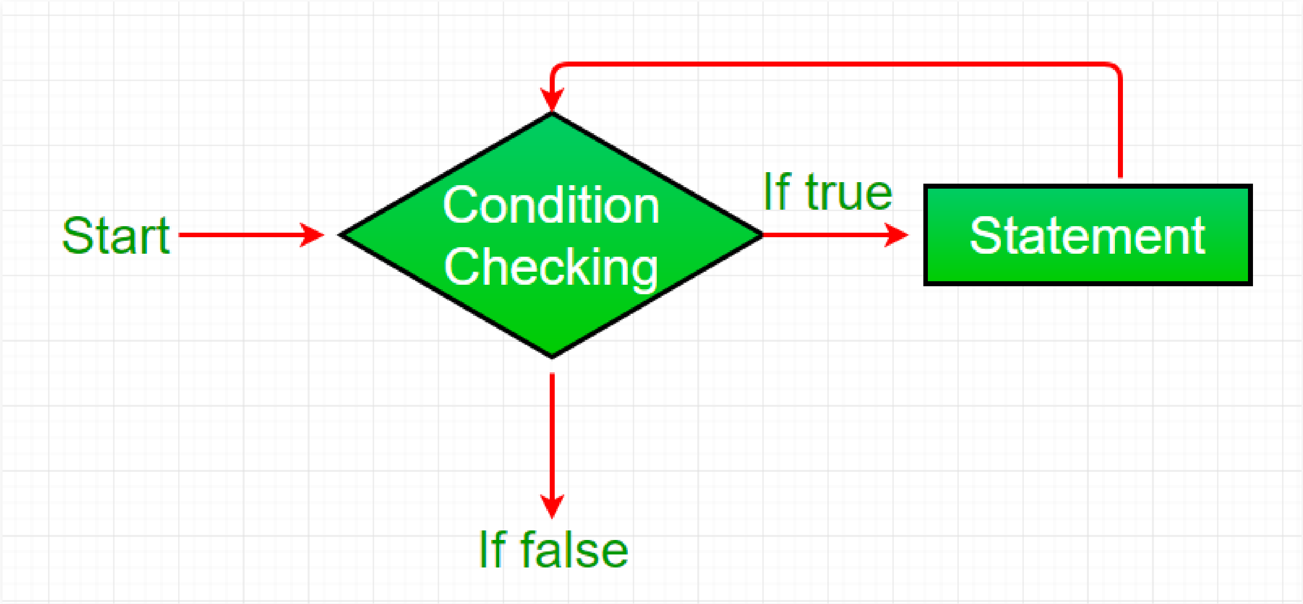
Example:

```
i++;
```

How does a While loop executes?

1. Control falls into the while loop.
2. The flow jumps to Condition
3. Condition is tested.
    a. If Condition yields true, the flow goes into the Body.
    b. If Condition yields false, the flow goes outside the loop
4. The statements inside the body of the loop get executed.
5. Updation takes place.
6. Control flows back to Step 2.
7. The do-while loop has ended and the flow has gone outside.

Flow chart while loop (for Control Flow):



Example 1: This program will try to print “Hello World” 5 times.

```
// Java program to illustrate while loop.

class whileLoopDemo {
    public static void main(String args[])
    {
        // initialization expression
        int i = 1;

        // test expression
        while (i < 6) {
            System.out.println("Hello World");

            // update expression
            i++;
        }
    }
}
```

Output:

```
Hello World
Hello World
Hello World
Hello World
Hello World
```

Dry-Running Example 1: The program will execute in the following manner.

```
1. Program starts.
2. i is initialized with value 1.
3. Condition is checked. 1 < 6 yields true.
  3.a) "Hello World" gets printed 1st time.
  3.b) Updation is done. Now i = 2.
4. Condition is checked. 2 < 6 yields true.
  4.a) "Hello World" gets printed 2nd time.
  4.b) Updation is done. Now i = 3.
5. Condition is checked. 3 < 6 yields true.
  5.a) "Hello World" gets printed 3rd time
  5.b) Updation is done. Now i = 4.
6. Condition is checked. 4 < 6 yields true.
  6.a) "Hello World" gets printed 4th time
  6.b) Updation is done. Now i = 5.
7. Condition is checked. 5 < 6 yields true.
  7.a) "Hello World" gets printed 5th time
  7.b) Updation is done. Now i = 6.
8. Condition is checked. 6 < 6 yields false.
9. Flow goes outside the loop. Program terminates.
```

Example 2: This program will find the summation of numbers from 1 to 10.

```java
// Java program to illustrate while loop

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

        // Exit when x becomes greater than 4
        while (x <= 10) {
            // summing up x
            sum = sum + x;

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

Output:

```
Summation: 55
```

Related Articles:

1. Loops in Java
2. Java For loop with Examples
3. Java do-while loop with Examples
4. Difference between for and while loop in C, C++, Java
5. Difference between while and do-while loop in C, C++, Java