loops

In programming, loops are used to repeat a block of code.

Example : If you want to show a message 1000 times, then rather than typing the same code 1000 times, you can use a loop.

In Java, there are three types of loops.

- for loop
- while loop
- do-while loop

for loop and **while** loop are **entry control loop** because the condition is checked before entering the loop body and **do-while** loop is **exit control loop** because the body is executed before checking the condition

for Loop

Java for loop is used to run a block of code for a certain number of times.

```java
for (initial-Expression; condition; update-Expression) {
        // body of the loop
}
```

initial-Expression : executes only once at the starting of the loop.

condition : If the **condition** is true, the body of the for loop is executed.

update-Expression : updates the value of **initial-Expression**.
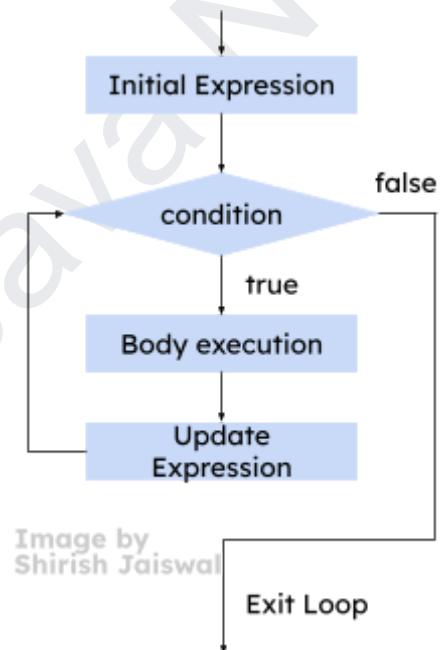
The process continues until the **condition** is false

Example 1 : Print numbers from 1 to 10

```java
for (int i = 1; i <= 10; i++) {
        System.out.println (i);
}
```

Example 2 : Print all the odd numbers between 15 to 30

```java
for (int i = 15; i <= 30; i++) {
        if (i%2 != 0) {
                System.out.println (i);
        }
}
```

while Loop

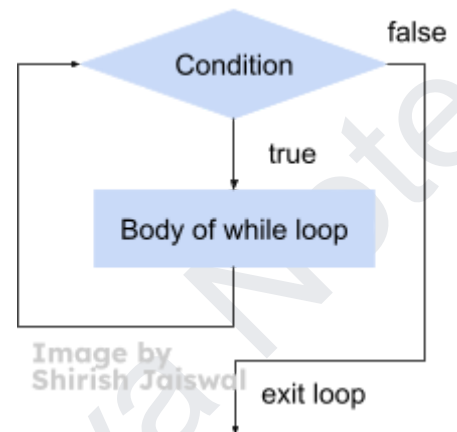Java while loop is used to run a specific code until a certain condition is met

```java
while (condition) {

        // body of the loop

}
```


Image by
Shirish Jaiswal

while loop checks the **condition** inside the parentheses ().

If the **condition** is true, the body of the while loop will get executed.

Condition is evaluated again.

This process continues until the **condition** is false and the loop ends.

Example 1 : Print numbers from 1 to 10

```java
int i = 1;
int n = 10;
while (i <= n) {

        System.out.println (i);

}
```

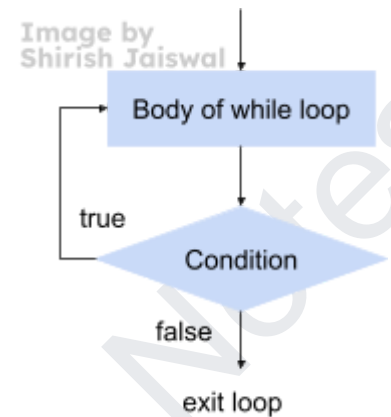**Example 1 :** Divide the number by 2 till and print quotient till it is 0.

```java
int i = 23;
while (i > 0) {

        i = i / 2;
        System.out.println (i);

}
```

---

do - while Loop

The **do - while** loop is similar to while loop. However, the body of do-while loop is executed once before the test expression is checked

```
do {
        // body of the loop
}
while (condition ) ;
```

1. The body of the loop is executed at first. Then the **condition** is checked.

2. If the **condition** is true, the body of the loop inside the do statement is executed again.

3. The **condition** is evaluated once again.

4. This process continues until the **condition** evaluates to false. Then the loop stops.

Example 1 : Print numbers from 1 to 10 if 5 is even

```
int i = 0;
int n = 5;
do {
        System.out.println (i);
        i++;
}
while (i <= n && i != 0) ;
```