



## For loop in java

The `for` loop in Java is a control structure that allows you to execute a block of code a specific number of times. It is particularly useful when you know in advance how many times you want to iterate through a block of code. The basic syntax of a `for` loop is:

### **\*\*Syntax:\*\***

```
```java
for (initialization; condition; update) {
    // code to be executed
}
```
```

- **\*\*Initialization\*\***: Sets a loop control variable (executed once at the beginning).
- **\*\*Condition\*\***: The loop continues as long as this condition is `true`.
- **\*\*Update\*\***: Updates the loop control variable after each iteration.

### **\*\*10 Examples of `for` Loop in Java:\*\***

#### **\*\*Example 1: Basic `for` Loop\*\***

Print numbers from 0 to 4.

```
```java
for (int i = 0; i < 5; i++) {
    System.out.println("i = " + i);
}
```
```

**\*\*Output:\*\***

Saifullah Haidari

```
...
```

```
i = 0
```

```
i = 1
```

```
i = 2
```

```
i = 3
```

```
i = 4
```

```
...
```

```
---
```

#### **\*\*Example 2: Summing Numbers\*\***

Calculate the sum of the first 5 natural numbers.

```
```java
```

```
int sum = 0;
```

```
for (int i = 1; i <= 5; i++) {
```

```
    sum += i; // Add i to sum
```

```
}
```

```
System.out.println("Sum = " + sum);
```

```
...
```

**\*\*Output:\*\***

```
...
```

```
Sum = 15
```

```
...
```

```
---
```

#### **\*\*Example 3: Printing Even Numbers\*\***

Print even numbers from 0 to 10.

```
```java
```

Saifullah Haidari

```
for (int i = 0; i <= 10; i += 2) {  
    System.out.println("Even Number: " + i);  
}
```

...

**\*\*Output:\*\***

...

Even Number: 0

Even Number: 2

Even Number: 4

Even Number: 6

Even Number: 8

Even Number: 10

...

---

#### **\*\*Example 4: Using `for` Loop with Arrays\*\***

Iterate over an array and print its elements.

```java

```
String[] fruits = {"Apple", "Banana", "Cherry"};
```

```
for (int i = 0; i < fruits.length; i++) {
```

```
    System.out.println("Fruit: " + fruits[i]);
```

```
}
```

...

**\*\*Output:\*\***

...

Fruit: Apple

Fruit: Banana

Fruit: Cherry

Saifullah Haidari

...

---

#### #### \*\*Example 5: Reverse a String\*\*

Use a `for` loop to reverse a string.

```
```java
```

```
String original = "Hello";
```

```
String reversed = "";
```

```
for (int i = original.length() - 1; i >= 0; i--) {
```

```
    reversed += original.charAt(i);
```

```
}
```

```
System.out.println("Reversed String: " + reversed);
```

```
...
```

**\*\*Output:\*\***

```
...
```

Reversed String: olleH

```
...
```

---

#### #### \*\*Example 6: Multiplication Table\*\*

Print the multiplication table of 5.

```
```java
```

```
int number = 5;
```

```
for (int i = 1; i <= 10; i++) {
```

```
    System.out.println(number + " x " + i + " = " + (number * i));
```

```
}
```

Saifullah Haidari

...

**\*\*Output:\*\***

...

5 x 1 = 5

5 x 2 = 10

5 x 3 = 15

5 x 4 = 20

5 x 5 = 25

5 x 6 = 30

5 x 7 = 35

5 x 8 = 40

5 x 9 = 45

5 x 10 = 50

...

---

**#### \*\*Example 7: Count Down\*\***

Use a `for` loop to count down from 10 to 1.

```java

for (int i = 10; i > 0; i--) {

    System.out.println("Countdown: " + i);

}

System.out.println("Liftoff!");

...

**\*\*Output:\*\***

...

Countdown: 10

Countdown: 9

Saifullah Haidari

Countdown: 8

Countdown: 7

Countdown: 6

Countdown: 5

Countdown: 4

Countdown: 3

Countdown: 2

Countdown: 1

Liftoff!

...

---

#### **\*\*Example 8: Nested `for` Loop\*\***

Print a simple multiplication table (1 to 3).

```java

```
for (int i = 1; i <= 3; i++) {  
    for (int j = 1; j <= 3; j++) {  
        System.out.println(i + " x " + j + " = " + (i * j));  
    }  
}
```

...

**\*\*Output:\*\***

...

1 x 1 = 1

1 x 2 = 2

1 x 3 = 3

2 x 1 = 2

2 x 2 = 4

Saifullah Haidari

2 x 3 = 6

3 x 1 = 3

3 x 2 = 6

3 x 3 = 9

...

---

#### \*\*Example 9: Finding the Maximum Number\*\*

Find the maximum number in an array.

```
```java
```

```
int[] numbers = {4, 2, 8, 5, 1};
```

```
int max = numbers[0];
```

```
for (int i = 1; i < numbers.length; i++) {
```

```
    if (numbers[i] > max) {
```

```
        max = numbers[i];
```

```
    }
```

```
}
```

```
System.out.println("Maximum Number: " + max);
```

```
...
```

**\*\*Output:\*\***

```
...
```

Maximum Number: 8

```
...
```

---

#### \*\*Example 10: Printing Fibonacci Series\*\*

Saifullah Haidari

Print the first 10 Fibonacci numbers.

```
```java
```

```
int n = 10;
```

```
int a = 0, b = 1;
```

```
System.out.println("Fibonacci Series:");
```

```
for (int i = 0; i < n; i++) {
```

```
    System.out.print(a + " ");
```

```
    int next = a + b; // Calculate the next number
```

```
    a = b; // Update a
```

```
    b = next; // Update b
```

```
}
```

```
```
```

**\*\*Output:\*\***

```
```
```

Fibonacci Series:

0 1 1 2 3 5 8 13 21 34

```
```
```

```
---
```

### ### Summary

- The `for` loop is versatile and commonly used for iterating over a range of values or collections.
- It allows you to control the iteration process through initialization, condition checking, and updating the loop variable.
- You can also use it for nested loops, array manipulation, and more complex operations.