

# Operators

Java Fundamentals

Libre Education



## Operators

An operator is a construct that performs a function to one or more values.

## Types of Operators

Operators are grouped by what kind of operation they perform.

### Arithmetic Operators

Arithmetic operators perform typical mathematical functions to two values.

1. = (Simple Assignment) - Assigns the value on the right to the value on the left
2. += (Add And Assign) - Adds the two values together and then assigns the value on the left to the result
3. -= (Subtract And Assign) - Subtracts the right value from the left value and then assigns the value on the left to the result
4. \*= (Multiply And Assign) - Multiplies the values together and then assigns the value on the left to the result
5. /= (Divide And Assign) - Divided the value on the left by the value on the right and then assigns the value on the left to the result

### Unary Operators

Unary operators require and perform a function to one value.

1. + (Unary Plus)
2. - (Unary Minus)
3. ++ (Increment) - Increases the value by 1
4. -- (Decrement) - Decreases the value by 1
5. ! (Logical Compliment) - Inverts the value of a boolean

### Equality And Relational Operators

Equality and Relational operators check for a condition and return a boolean but do not manipulate values

1. == (Equal To) - Returns true if the two values are equal to each other
2. != (Not Equal To) - Returns true if the two values are not equal to each other
3. > (Greater Than) - Returns true if the value on the left is greater than the value on the right
4. < (Less Than) - Returns true if the value on the left is less than the value on the right

5. `>=` (Greater Than or Equal To) - Returns true if the value on the left is greater than or equal to the value on the right
6. `<=` (Less Than or Equal To) - Returns true if the value on the left is less than or equal to the value on the right

## Conditional Operators

Conditional operators check two statements or expressions and return a boolean based on the result

1. `&&` (Conditional AND) - Returns true if both statements are true
2. `||` (Conditional OR) - Returns true if at least one of the statements are true

## Bitwise and Bitshift Operators

Bitwise and Bitshift operators manipulate values at the byte level. They take place between each parallel pair of bits in the value

1. `~` (Unary Bitwise Complement) - Inverts each bit in the value
2. `&` (Bitwise AND) - If both corresponding bits are 1, the result is 1
3. `|` (Bitwise Inclusive OR) - If either of the corresponding bits are 1, the result is 1
4. `^` (Bitwise Exclusive OR) - If both of the corresponding bits are 1, the result is 1

## Other Resources

1. Wikipedia ([en.wikipedia.org/wiki/Operator\\_\(computer\\_programming\)](https://en.wikipedia.org/wiki/Operator_(computer_programming)))
2. The Java Tutorials ([docs.oracle.com/javase/tutorial/java/nutsandbolts/operators.html](https://docs.oracle.com/javase/tutorial/java/nutsandbolts/operators.html))
3. TutorialsPoint ([www.tutorialspoint.com/java/java\\_basic\\_operators.htm](http://www.tutorialspoint.com/java/java_basic_operators.htm))

### Bitwise and Bitshift Operators

4. Rose India ([www.roseindia.net/java/master-java/bitwise-bitshift-operators.shtml](http://www.roseindia.net/java/master-java/bitwise-bitshift-operators.shtml))