

Java Operators with Code Examples and Outputs

1. Arithmetic Operators

These operators perform basic mathematical operations:

`+` : Addition ($a + b$)

`-` : Subtraction ($a - b$)

`*` : Multiplication ($a * b$)

`/` : Division (a / b)

`%` : Modulus ($a \% b$)

Example Code:

```
int a = 10, b = 3;

System.out.println("Add: " + (a + b));
System.out.println("Sub: " + (a - b));
System.out.println("Mul: " + (a * b));
System.out.println("Div: " + (a / b));
System.out.println("Mod: " + (a % b));
```

Expected Output:

Add: 13

Sub: 7

Mul: 30

Div: 3

Mod: 1

2. Assignment Operators

Used to assign values to variables:

`=` : Assign ($a = 10$)

`+=` : Add and assign ($a += 5$) $\rightarrow a = a + 5$

`-=` : Subtract and assign ($a -= 5$)

`*=` : Multiply and assign ($a *= 5$)

`/=` : Divide and assign ($a /= 5$)

`%=` : Modulus and assign (`a %= 5`)

Example Code:

```
int a = 10;  
a += 5;  
a -= 2;  
a *= 3;  
a /= 2;  
a %= 4;  
System.out.println("Final a: " + a);
```

Expected Output:

Final a: 1

3. Relational Operators

Used to compare two values. Returns boolean result:

`==` : Equal to (`a == b`)

`!=` : Not equal to (`a != b`)

`>` : Greater than (`a > b`)

`<` : Less than (`a < b`)

`>=` : Greater than or equal to (`a >= b`)

`<=` : Less than or equal to (`a <= b`)

Example Code:

```
int a = 10, b = 20;  
System.out.println(a == b);  
System.out.println(a != b);  
System.out.println(a > b);  
System.out.println(a < b);  
System.out.println(a >= b);  
System.out.println(a <= b);
```

Expected Output:

false

true

false

true

false

true

4. Unary Operators

Operate on a single operand:

`+` : Unary plus (`+a`)

`-` : Unary minus (`-a`)

`++` : Increment (`++a` / `a--`)

`--` : Decrement (`--a` / `a--`)

`!` : Logical NOT (`!true`)

Example Code:

```
int a = 5;
```

```
System.out.println(+a);
```

```
System.out.println(-a);
```

```
System.out.println(++a);
```

```
System.out.println(a--);
```

```
System.out.println(a);
```

```
boolean flag = false;
```

```
System.out.println(!flag);
```

Expected Output:

5

-5

6

6

5

true

5. Logical Operators

Used to combine multiple boolean conditions:

`&&` : Logical AND (`a > 5 && a < 10`)

`||` : Logical OR (`a > 5 || b < 3`)

`!` : Logical NOT (`!(a > 5)`)

Example Code:

```
int a = 10, b = 5;
```

```
System.out.println((a > 5) && (b < 10));
```

```
System.out.println((a < 5) || (b < 10));
```

```
System.out.println(!(a < b));
```

Expected Output:

true

true

true