

Java for beginners

Operators in Java



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Agenda

- ① Classification of operators
- ② Unary operators
- ③ Arithmetic operators
- ④ Bitwise Operators
- ⑤ Relational operators
- ⑥ Logical operators
- ⑦ conditional Operator
- ⑧ Assignment operators
- ⑨ instance of operators

Classification of Operators

Operators are used to manipulate data to produce useful information

$3 + 4$

↑
operator

← Operands / data

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Unary Operators

$+, -, ++, --$

unary + unary -

+5

-7

Decrement

--

$\text{int } x = 5;$

post decrement $x--;$ $\rightarrow x = x - 1$
predecrement $--x;$ $\rightarrow x = x - 1$

Increment

++

$\text{int } x = 5;$

post increment $\rightarrow x++; \rightarrow x = x + 1$

$\nearrow ++x; \rightarrow x = x + 1$

preincrement

increment & decrement operators will work
only on variables and not constants.

Arithmetic Operators

* , / , %.

$$a \checkmark b/c$$

$$\downarrow \\ 5 \% 2 \quad |$$

+ , -

$$a \checkmark b * c$$

$$-5 \% 2 \quad -|$$

$$\begin{array}{r} 2) \overline{6}(0 \\ \underline{0} \\ 6 \end{array}$$

$$a + b \checkmark c$$

$$5 \% -2 \quad |$$

$$\begin{array}{r} 6/7 \rightarrow 6 \\ \underline{-} \end{array}$$

$$\begin{array}{r} 2) \overline{5.5}(2 \\ \underline{4.0} \\ 1.5 \end{array}$$

$$-5 \% -2 \quad -|$$

Unlike C, java allows real constants with modulo operator

Bitwise Operators

$\&$, $|$, \wedge , \sim , $>>$, $<<$
AND OR XOR NOT Right Shift Left Shift

Bit \rightarrow 0 or 1

35 & 53 \rightarrow 33

$$35 = \begin{array}{r} 00100011 \\ \text{---} \end{array}$$

$$53 = \begin{array}{r} 00110101 \\ \hline 00100001 \\ \text{---} \end{array}$$

$$\begin{array}{cccccccccc} & & 7 & 6 & 5 & 4 & 3 & 2 & 1 & 0 \\ \dots & - & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ & & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array}$$

$$53 =$$

$0 0 \rightarrow 0$	$0 \wedge 0 \rightarrow 0$	$\sim 0 \rightarrow 1$
$0 1 \rightarrow 1$	$0 \wedge 1 \rightarrow 1$	$\sim 1 \rightarrow 0$
$1 0 \rightarrow 1$	$1 \wedge 0 \rightarrow 1$	
$1 1 \rightarrow 1$	$1 \wedge 1 \rightarrow 0$	

$>>$

$200 >> 2 \rightarrow 50$

$<<$



$32 \quad 16 \quad 2$

00000000000000000000000000110010

$12 << 3$

000000000000000000001100000 = 96



Relational Operators

<, >, <=, >=

==, !=

- Always give boolean type result

int cannot be converted to boolean

Logical Operators

! NOT
&& AND
|| OR
! boolean

! true → false

! false → true

boolean && boolean	boolean boolean
true && true → true	false false → false
true && false → false	false true → true
false && X → false	true X → true

! 5 > 2

Conditional Operator

? :

Ternary operator

Next class

Assignment Operators

=, +=, -=, *=, /=, %=

$x = 4;$ ✓

$4 = 3;$ } error
 $4 = x;$

$x += 4 \rightarrow x = x + 4$

$x -= 7 \rightarrow x = x - 7$

$x *= 5 \rightarrow x = x * 5$

int $x = 5;$

$x = x + 7;$

↑
Container content

Instance of Operator

Object instanceof ClamName/SubClass/interface

Result will be either True or False

Si instanceof String → true
→ false