Operators

The Arithmetic Operators

Operator	Description
+	Addition
-	Subtraction
*	Multiplication
/	Returns Quotient
%	Returns Remainder
++	Increment the value of operand by 1.
--	Decrement the value of operand by 1.

The Relational Operators

Operator	Description
==	Equal to
!=	Not equal to
>	Greater Than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

The Bitwise Operators

Operator	Description
&	Binary AND Operator copies a bit to the result if it exists in both operands.
|	Binary OR Operator copies a bit if it exists in either operand.
^	Binary XOR Operator copies the bit if it is set in one operand but not both.
~	Binary Ones Complement Operator is unary and has the effect of 'flipping' bits.
<<	Binary Left Shift Operator. The left operands value is moved left by the number of bits specified by the right operand.
>>	Binary Right Shift Operator. The left operands value is moved right by the number of bits specified by the right operand.
>>>	Shift right zero fill operator. The left operands value is moved right by the number of bits specified by the right operand and shifted values are filled up with zeros.

x=50 y=30
x=00110010
y=00011110

x&y	00010010 (18)
x|y	00111110(62)
x^y	00101100(44)
~x	11001100(-51)
x<<2	11001000(200)
x>>2	1100(12)
x>>>2	00001100(12)

The Logical Operators

Operator	Description
&&	Logical AND operator. If both the operands are non-zero, then the condition becomes true.
||	Logical OR Operator. If any of the two operands are non-zero, then the condition becomes true.
!	Logical NOT Operator. If a condition is true then Logical NOT operator will make false.

The Assignment Operators

Operator	Description
=	C = A + B will assign value of A + B into C
+=	B += A is equivalent to B = B + A
-=	B -= A is equivalent to B = B – A
*=	B *= A is equivalent to B = B * A
/=	B /= A is equivalent to B = B / A
%=	B %= A is equivalent to B = B % A
<<=	B <<= 2 is same as B = B << 2
>>=	B >>= 2 is same as B = B >> 2
&=	B &= 2 is same as B = B & 2
^=	B ^= 2 is same as B = B ^ 2
|=	B |= 2 is same as B = B | 2

Miscellaneous Operators

Operator	Description
Conditional operator (? :)	Also known as the ternary operator. Operator is used to decide which value should be assigned to the variable. (Condition)?value if true: value if false
Instanceof operator	This operator is used only with object reference variables. The operator checks whether an object is an instance of a class, an instance of a subclass (Object reference variable) instanceof (class/interface/type)

```
a=50
b = (a >= 10) ? 20: 30;   (b=20)
```

```
a=50
b = (a == 10) ? 20: 30;   (b=30)
```

```
String name = "James";
boolean result = name
instanceof String;

(result= true)
```

Precedence of Java Operators

Category	Operator
postfix	*expr*++ *expr*--
unary	++*expr* --*expr* +*expr* -*expr* ~ !
multiplicative	* / %
additive	+ -
shift	<< >> >>>
relational	< > <= >= instanceof
equality	== !=
bitwise AND	&
bitwise exclusive OR	^
bitwise inclusive OR	|
logical AND	&&
logical OR	||
ternary	? :