

PYTHON-OPERATORS

BY

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Types of Operator

- ▶ Arithmetic Operators
- ▶ Comparison (Relational) Operators
- ▶ Assignment Operators
- ▶ Logical Operators
- ▶ Bitwise Operators
- ▶ Membership Operators
- ▶ Identity Operators



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Arithmetic Operators

Operator	Description	Example
+ Addition	Adds values on either side of the operator.	a + b = 31
- Subtraction	Subtracts right hand operand from left hand operand.	a - b = -11
* Multiplication	Multiplies values on either side of the operator	a * b = 210
/ Division	Divides left hand operand by right hand operand	b / a = 2.1
% Modulus	Divides left hand operand by right hand operand and returns remainder	b % a = 1
** Exponent	Performs exponential (power) calculation on operators	a**b =10 to the power 20
//	Floor Division - The division of operands where the result is the quotient in which the digits after the decimal point are removed. But if one of the operands is negative, the result is floored, i.e., rounded away from zero (towards negative infinity):	9//2 = 4 and 9.0//2.0 = 4.0, -11//3 = -4, -11.0//3 = -4.0

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CODE

- ▶ a = 21
- ▶ b = 10
- ▶ c = 0

- ▶ c = a + b
- ▶ print ("Line 1 - Value of c is ", c)
- ▶ c = a - b
- ▶ print ("Line 2 - Value of c is ", c)
- ▶ c = a * b
- ▶ print ("Line 3 - Value of c is ", c)
- ▶ c = a / b
- ▶ print ("Line 4 - Value of c is ", c)

```
c = a % b
print ("Line 5 - Value of c is ", c)

a = 2
b = 3
c = a**b
print ("Line 6 - Value of c is ", c)

a = 10
b = 5
c = a//b
print ("Line 7 - Value of c is ", c)
```

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Comparison Operators

Operator	Description	Example
==	If the values of two operands are equal, then the condition becomes true.	(a == b) is not true.
!=	If values of two operands are not equal, then condition becomes true.	(a!= b) is true.
>	If the value of left operand is greater than the value of right operand, then condition becomes true.	(a > b) is not true.
<	If the value of left operand is less than the value of right operand, then condition becomes true.	(a < b) is true.
>=	If the value of left operand is greater than or equal to the value of right operand, then condition becomes true.	(a >= b) is not true.
<=	If the value of left operand is less than or equal to the value of right operand, then condition becomes true.	(a <= b) is true.

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CODE

```
a = 21
b = 10

if ( a == b ):
    print ("Line 1 - a is equal to b")
else:
    print ("Line 1 - a is not equal to b")

if ( a != b ):
    print ("Line 2 - a is not equal to b")
else:
    print ("Line 2 - a is equal to b")

if ( a < b ):
    print ("Line 3 - a is less than b" )
else:
```

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```
if ( a > b ):
    print ("Line 4 - a is greater than b")
else:
    print ("Line 4 - a is not greater than b")

a,b=b,a #values of a and b swapped. a becomes 10, b becomes 21

if ( a <= b ):
    print ("Line 5 - a is either less than or equal to b")
else:
    print ("Line 5 - a is neither less than nor equal to b")

if ( b >= a ):
    print ("Line 6 - b is either greater than or equal to b")
else:
    print ("Line 6 - b is neither greater than nor equal to b")
```

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Assignment Operators

Operator	Description	Example
=	Assigns values from right side operands to left side operand	c = a + b assigns value of a + b into c
+= Add AND	It adds right operand to the left operand and assign the result to left operand	c += a is equivalent to c = c + a
-= Subtract AND	It subtracts right operand from the left operand and assign the result to left operand	c -= a is equivalent to c = c - a
*= Multiply AND	It multiplies right operand with the left operand and assign the result to left operand	c *= a is equivalent to c = c * a
/= Divide AND	It divides left operand with the right operand and assign the result to left operand	c /= a is equivalent to c = c / a
%= Modulus AND	It takes modulus using two operands and assign the result to left operand	c %= a is equivalent to c = c % a
**= Exponent AND	Performs exponential (power) calculation on operators and assign value to the left operand	c **= a is equivalent to c = c ** a
//= Floor Division	It performs floor division on operators and assign value to the left operand	c //= a is equivalent to c = c // a

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```
a = 21
b = 10
c = 0

c = a + b
print ("Line 1 - Value of c is ", c)

c += a
print ("Line 2 - Value of c is ", c )

c *= a
print ("Line 3 - Value of c is ", c )

c /= a
print ("Line 4 - Value of c is ", c )

c = 2
c %= a
print ("Line 5 - Value of c is ", c)

c **= a
print ("Line 6 - Value of c is ", c)

c //= a
print ("Line 7 - Value of c is ", c)
```

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Bitwise Operators

Operator	Description	Example
& Binary AND	Operator copies a bit, to the result, if it exists in both operands	(a & b) (means 0000 1100)
Binary OR	It copies a bit, if it exists in either operand.	(a b) = 61 (means 0011 1101)
^ Binary XOR	It copies the bit, if it is set in one operand but not both.	(a ^ b) = 49 (means 0011 0001)
~ Binary Ones Complement	It is unary and has the effect of 'flipping' bits.	(~a) = -61 (means 1100 0011 in 2's complement form due to a signed binary number.
<< Binary Left Shift	The left operand's value is moved left by the number of bits specified by the right operand.	a << = 240 (means 1111 0000)
>> Binary Right Shift	The left operand's value is moved right by the number of bits specified by the right operand.	a >> = 15 (means 0000 1111)

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```
a = 60
b = 13
```

```
print ('a=',a,':',bin(a),'b=',b,':',bin(b))
c = 0
c = ~a;
print ("result of COMPLEMENT is ", c,':',bin(c))
```

```
c = a & b;
print ("result of AND is ", c,':',bin(c))
c = a << 2;
print ("result of LEFT SHIFT is ", c,':',bin(c))
```

```
c = a | b;
print ("result of OR is ", c,':',bin(c))
c = a >> 2;
print ("result of RIGHT SHIFT is ", c,':',bin(c))
```

Logical Operators



Operator	Description	Example
and Logical AND	If both the operands are true then condition becomes true.	(a and b) is False.
or Logical OR	If any of the two operands are non-zero then condition becomes true.	(a or b) is True.
not Logical NOT	Used to reverse the logical state of its operand.	Not(a and b) is True.

Membership Operators



► Python’s membership operators test for membership in a sequence, such as strings, lists, or tuples.

Operator	Description	Example
is	Evaluates to true if the variables on either side of the operator point to the same object and false otherwise.	x is y, here is results in 1 if id(x) equals id(y).
is not	Evaluates to false if the variables on either side of the operator point to the same object and true otherwise.	x is not y, here is not results in 1 if id(x) is not equal to id(y).

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```
a = 10
b = 20
list = [1, 2, 3, 4, 5 ]
```

```
if ( a in list ):
    print ("Line 1 - a is available in the given list")
else:
    print ("Line 1 - a is not available in the given list")
```

```
if ( b not in list ):
    print ("Line 2 - b is not available in the given list")
else:
    print ("Line 2 - b is available in the given list")
```

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```
c=b/a
if ( c in list ):
    print ("Line 3 - a is available in the given list")
else:
    print ("Line 3 - a is not available in the given list")
```



Identity Operators

► Identity operators compare the memory locations of two objects



Operator	Description	Example
is	Evaluates to true if the variables on either side of the operator point to the same object and false otherwise.	x is y, here is results in 1 if id(x) equals id(y).
is not	Evaluates to false if the variables on either side of the operator point to the same object and true otherwise.	x is not y, here is not results in 1 if id(x) is not equal to id(y).


```
a = 20
b = 20
print ('Line 1','a=',a,':',id(a), 'b=',b,':',id(b))

if ( a is b ):
    print ("Line 2 - a and b have same identity")
else:
    print ("Line 2 - a and b do not have same identity")

if ( id(a) == id(b) ):
    print ("Line 3 - a and b have same identity")
else:
    print ("Line 3 - a and b do not have same identity")
```

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```
b = 30
print ('Line 4','a=',a,':',id(a), 'b=',b,':',id(b))

if ( a is not b ):
    print ("Line 5 - a and b do not have same identity")
else:
    print ("Line 5 - a and b have same identity")
```

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Operators Precedence

S.No.	Operator & Description
1	** Exponentiation (raise to the power)
2	~ + - Ccomplement, unary plus and minus (method names for the last two are +@ and -@)
3	* / % // Multiply, divide, modulo and floor division
4	+ - Addition and subtraction
5	>> << Right and left bitwise shift
6	& Bitwise 'AND'

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Operators Precedence

S.No.	Operator & Description
7	^ Bitwise exclusive 'OR' and regular 'OR'
8	<= < > >= Comparison operators
9	<> == != Equality operators
10	= %= /= //= -= += *= **= Assignment operators
11	is is not Identity operators
12	in not in Membership operators
13	not or and Logical operators

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