

☆ PYTHON OPERATORS - With Examples ☆

Operators are special symbols that perform operations on variables and values.

① Arithmetic Operators

Used to perform mathematical operations.

Operator	Meaning	Example	Result
+	Addition	a = 10, b = 3	13
-	Subtraction	a - b	7
*	Multiplication	a * b	30
/	Division	a / b	3.3333
//	Floor Division	a // b	3
%	Modulus (Remainder)	a % b	1
**	Exponentiation	a ** b	1000

Example:

```
a = 10
b = 3
print(a / b)    # 3.3333
print(a // b)   # 3
print(a % b)    # 1
print(a * b)    # 30
print(a ** b)   # 1000
```

② Relational (Comparison) Operators

Used to compare two values. Returns True or False.

Operator	Meaning	Example	Result
==	Equal to	a = 10, b = 10 a == b	True
!=	Not equal to	a != b	False
>	Greater than	a = 10, b = 5 a > b	True
<	Less than	a < b	False
>=	Greater than or equal to	a >= b	True
<=	Less than or equal to	a <= b	False

Example:

```
a = 7
b = 3
print(a == b) # False
print(a != b) # True
print(a > b)  # True
print(a < b)  # False
print(a >= b) # True
print(a <= b) # False
```

③ Logical Operators

Used to combine conditional statements.

Operator	Meaning	Example	Result
and	Returns True if both conditions are True	(5 > 2) and (3 < 4)	True
or	Returns True if at least one condition is True	(5 > 2) or (3 > 4)	True
not	Reverses the result (Returns False if True and True if False)	not (5 > 2)	False

Example:

```
a = 5
b = 10
print(a < b and b > 5) # True
print(a > b or b > 5)  # True
print(not (a == b))    # True
```

Think:
not has the highest
priority among these.

④ Assignment Operators

Used to assign values to variables.

Operator	Example	Same as	Example:
=	a = 10	a = 10	a = 10
+=	a += 5	a = a + 5	a += 2 # a = 12
-=	a -= 5	a = a - 5	a -= 3 # a = 9
*=	a *= 5	a = a * 5	a *= 4 # a = 36
/=	a /= 5	a = a / 5	a /= 6 # a = 6.0
%=	a %= 5	a = a % 5	a //= 4 # a = 1
//=	a //= 5	a = a // 5	a %= 3 # a = 1
**=	a **= 5	a = a ** 5	a **= 3 # a = 1

⑤ Augmented Assignment Operators

Shortcut way of performing operation and assignment.

Operator	Example	Same as
+=	x += y	x = x + y
-=	x -= y	x = x - y
*=	x *= y	x = x * y
/=	x /= y	x = x / y
%=	x %= y	x = x % y
//=	x //= y	x = x // y
**=	x **= y	x = x ** y

Why useful?

Saves time and
makes code
short and clean.

Example:

```
x = 5
x += 3 # 8
x **= 2 # 16
x //= 5 # 3
x **= 2 # 9
```

⑥ Identity Operators

Used to check whether two variables point to the same object in memory.

Operator	Meaning	Example	Result
is	Returns True if both operands are the same object	a = [1, 2] b = a a is b	True
is not	Returns True if both operands are not the same object	a = [1, 2] b = [1, 2] a is not b	True

Example:

```
a = 10
b = 10
print(a is b) # True (same object)
print(a is c) # False (different object)
print(a is not c) # True
```

Note: 'is' checks
memory location,
not value.

⑦ Membership Operators

Used to test if a value is present in a sequence (list, tuple, string, set, dictionary).

Operator	Meaning	Example	Result
in	Returns True if value is found in the sequence	lst = [10, 20, 30] 20 in lst	True
not in	Returns True if value is not found in the sequence	'a' not in 'python'	True

Example:

```
s = "python"
print('p' in s) # True
print('z' in s) # False
print('on' in s) # True
print('py' not in s) # False
```

Works with
strings, lists,
tuples, sets,
and dictionaries.

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