

Operators in Python

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AGENDA

- What Are Operators?
- Arithmetic Operators
- Comparison Operators
- Logical Operators
- Assignment Operators
- Practice Questions

What Are Operators?

- **Definition:** Operators are special symbols or keywords in Python that perform specific operations on values or variables.
- **Examples:** Addition (+), Equality (==), Logical AND (and), etc.

Types of Operators

```
graph TD; A[Types of Operators] --> B[Arithmetic Operators]; A --> C[Comparison Operators]; A --> D[Logical Operators]; A --> E[Assignment Operators];
```

Arithmetic
Operators

Comparison
Operators

Logical
Operators

Assignment
Operators

Arithmetic Operators

- **Purpose:** Perform mathematical operations.

Operator	Description	Example
+	Addition	$5 + 3 = 8$
-	Subtraction	$10 - 4 = 6$
*	Multiplication	$6 * 7 = 42$
/	Division	$10 / 2 = 5.0$
%	Modulus (remainder)	$10 \% 3 = 1$
**	Exponentiation	$2 ** 3 = 8$

Comparison Operators

- **Purpose:** Compare two values and return a Boolean result (True or False).

Operator	Description	Example
==	Equal to	5 == 5 → True
!=	Not equal to	5 != 3 → True
<	Less than	3 < 5 → True
>	Greater than	7 > 2 → True
<=	Less than or equal to	5 <= 5 → True
>=	Greater than or equal to	4 >= 2 → True

Logical Operators

- **Purpose:** Combine multiple conditions and return a Boolean result.

Operator	Description	Example
and	Both conditions must be true	$(5 > 3) \text{ and } (8 > 6) \rightarrow \text{True}$
or	At least one condition must be true	$(5 > 10) \text{ or } (8 > 6) \rightarrow \text{True}$
not	Negates a condition	$\text{not}(5 > 3) \rightarrow \text{False}$

Assignment Operators

- **Purpose:** Assign values to variables with optional modification.

Operator	Description	Example
=	Assigns value	$x = 10$
+=	Add and assign	$x += 5 \rightarrow x = 15$
-=	Subtract and assign	$x -= 2 \rightarrow x = 8$
*=	Multiply and assign	$x *= 3 \rightarrow x = 30$
/=	Divide and assign	$x /= 2 \rightarrow x = 5$

Summary

- Operators are essential for performing operations in Python.
- Four types discussed:
 - Arithmetic
 - Comparison
 - Logical
 - Assignment

Practice Questions

- Write a Python program to calculate the square of a number using `**`.
- Use comparison and logical operators to check if a number is between 10 and 20.
- Increment a variable by 10 using the `+=` operator.