🌟 Operators In Python

Operators are used to perform mathematical and logical operations on the variables. Each operation uses a symbol called the operator to denote the type of operation it performs.

Operands: It represents the data.
Operator: It represents how the operands will be processed to produce a value.

```
2 + 3
```

Note: Suppose the given expression is 2 + 3. Here **2** and **3** are operands, and **+** is the operator.

🚀Arithmetic Operators

These are used to perform basic arithmetic operations like addition, subtraction, multiplication, etc.

Symbol	Name	Description
+	Addition	For adding two operands
-	Subtraction	For subtracting two operands
*	Multiplication	For multiplying two operands
/	Division	For dividing two operands
//	Integer Division	Divides and returns the integer value
%	Modulus	Returns the remainder from division
**	Exponentiation	Raises one operand to the power of another

🎉Example 1: Arithmetic Operator

This code performs and prints the results of various arithmetic operations on num1 and num2.

```python
# Initialize the variables
num1 = 10
num2 = 3

# Performing Operations
addition = num1 + num2
subtraction = num1 - num2
multiplication = num1 * num2
division = num1 / num2
floor_division = num1 // num2
modulus = num1 % num2
exponentiation = num1 ** num2

# Displaying Results
print(f"Addition: {num1} + {num2} = {addition}")
print(f"Subtraction: {num1} - {num2} = {subtraction}")
print(f"Multiplication: {num1} * {num2} = {multiplication}")
print(f"Division: {num1} / {num2} = {division}")
print(f"Floor Division: {num1} // {num2} = {floor_division}")
print(f"Modulus: {num1} % {num2} = {modulus}")
print(f"Exponentiation: {num1} ** {num2} = {exponentiation}")
```

🚀Comparison Operators

These are used to compare two values.

Symbol	Name	Description
==	Equal	Checks if the value of two operands are equal
!=	Not Equal	Checks if the value of two operands are not equal
>	Greater Than	Checks if the value of the left operand is greater than the right operand
<	Less Than	Checks if the value of the left operand is less than the right operand
>=	Greater or Equal	Checks if the value of the left operand is greater than or equal to the right operand

🎉Example 2: Comparison Operator

This code performs and prints the results of various comparison operations on num1 and num2.

```
# Initialize the variables
num1 = 10
num2 = 3

# Performing Comparison Operations
equal = num1 == num2
not_equal = num1 != num2
greater_than = num1 > num2
less_than = num1 < num2
greater_or_equal = num1 >= num2
less_or_equal = num1 <= num2

# Displaying Results
print(f"Equal: {num1} == {num2} is {equal}")
print(f"Not Equal: {num1} != {num2} is {not_equal}")
print(f"Greater Than: {num1} > {num2} is {greater_than}")
print(f"Less Than: {num1} < {num2} is {less_than}")
print(f"Greater or Equal: {num1} >= {num2} is {greater_or_equal}")
print(f"Less or Equal: {num1} <= {num2} is {less_or_equal}")
```

🚀Logical Operators

These are used to combine conditional statements.

Symbol	Name	Description
and	AND	Returns True if both statements are true
or	OR	Returns True if one of the statements is true
not	NOT	Reverses the result, returns False if the result is true

🎉Example 3: Logical Operator

This code performs and prints the results of various logical operations (AND, OR, NOT) on boolean expressions involving num1 and num2.

```
# Initialize the variables
num1 = 10
num2 = 3

# Performing Logical Operations
and_operation = (num1 > num2) and (num1 < 20)
or_operation = (num1 < num2) or (num1 < 20)
not_operation = not(num1 > num2)

# Displaying Results
print(f"AND Operation: (num1 > num2) and (num1 < 20) is
{and_operation}")
print(f"OR Operation: (num1 < num2) or (num1 < 20) is {or_operation}")
print(f"NOT Operation: not(num1 > num2) is {not_operation}")
```

🚀Assignment Operators

These are used to assign values to variables.

Symbol	Name	Description
=	Assignment	Assigns the right-hand operand to the left-hand operand
+=	Add and Assignment	Adds right operand to the left operand and assigns the result to the left operand
-=	Subtract and Assignment	Subtracts right operand from the left operand and assigns the result to the left operand
*=	Multiply and Assignment	Multiplies the left operand with the right operand and assigns the result to the left operand
/=	Divide and Assignment	Divides the left operand by the right operand and assigns the result to the left operand

🎉Example 4: Assignment Operators

This code demonstrates various assignment operations on the variable num1 using num2 and prints the results.

```
# Initialize the variables
num1 = 10
num2 = 3

# Performing Assignment Operations
initial_assignment = num1
num1 += num2
add_and_assign = num1

num1 -= num2
subtract_and_assign = num1

num1 *= num2
multiply_and_assign = num1

num1 /= num2
divide_and_assign = num1

# Displaying Results
print(f"Initial assignment: num1 = {initial_assignment}")
print(f"Add and assign: num1 += num2 -> num1 = {add_and_assign}")
print(f"Subtract and assign: num1 -= num2 -> num1 =
{subtract_and_assign}")
print(f"Multiply and assign: num1 *= num2 -> num1 =
{multiply_and_assign}")
print(f"Divide and assign: num1 /= num2 -> num1 = {divide_and_assign}")
```

🚀Membership Operators

These are used to test if a value is available in a sequence or not.

Symbol	Name	Description
in	In	Returns True if a specified value is found in the sequence
not in	Not In	Returns True if a specified value is not found in the sequence

🎉Example 5: Membership Operators

This code demonstrates the use of membership operators to check for the presence of items in a list.

```
# Initialize the list
fruits = ["apple", "banana", "cherry"]

# Performing Membership Operations
is_banana_in_fruits = "banana" in fruits
is_grape_in_fruits = "grape" in fruits
is_apple_not_in_fruits = "apple" not in fruits
is_grape_not_in_fruits = "grape" not in fruits

# Displaying Results
print(f'"banana" in fruits: {is_banana_in_fruits}')
print(f'"grape" in fruits: {is_grape_in_fruits}')
print(f'"apple" not in fruits: {is_apple_not_in_fruits}')
print(f'"grape" not in fruits: {is_grape_not_in_fruits}')
```

💡 Challenge 6: Solve this questions

1. Write a program that takes the ages of two people as input from the user. Compare their ages using comparison operators (==, !=, >, <, >=, <=) and print messages indicating the results (e.g., "Person 1 is older than Person 2").
2. Write a program that takes the age and citizenship status of a person as input from the user. Use logical operators (and, or, not) to determine if the person is eligible to vote (age >= 18 and is a citizen). Print an appropriate message based on the result.
3. Write a program that initializes a list of books available in a library. Take the name of a book as input from the user and check if it is available in the library using membership operators (in, not in). Print a message indicating whether the book is available or not.