## **🎬 Operators & Expressions in Python**

### **✅ What is an Operator?**

An **operator** is a symbol that performs a specific operation on one or more values (called operands).

Examples of operators:

* +, -, \*, / → Arithmetic
* ==, !=, <, > → Comparison
* and, or, not → Logical
* &, |, ^ → Bitwise

### **✅ What is an Expression?**

An **expression** is a combination of **variables**, **values**, and **operators** that **evaluates to a result**.

📦 Example:

x = 10 + 5 # ← '10 + 5' is an expression; '+' is the operator

### **➕ 1. Arithmetic Operators**

Used for math calculations.

a = 10

b = 3

print(a + b) # Addition → 13

print(a - b) # Subtraction → 7

print(a \* b) # Multiplication → 30

print(a / b) # Division → 3.333...

print(a % b) # Modulus → 1

print(a \*\* b) # Exponent → 1000

print(a // b) # Floor division → 3

### **⚖️ 2. Comparison Operators**

Used to compare values — returns True or False.

x = 5

y = 10

print(x == y) # False

print(x != y) # True

print(x < y) # True

print(x >= y) # False

### **🧠 3. Logical Operators**

Used to combine multiple conditions.

a = True

b = False

print(a and b) # False

print(a or b) # True

print(not a) # False

### **⚡ 4. Bitwise Operators**

Works on bits (binary-level operations) — commonly used in systems, sensors, etc.

a = 5 # 0101

b = 3 # 0011

print(a & b) # AND → 1 (0001)

print(a | b) # OR → 7 (0111)

print(a ^ b) # XOR → 6 (0110)

print(~a) # NOT → -6 (inverts bits)

print(a << 1) # Left shift → 10

print(a >> 1) # Right shift → 2

### **🎯 Wrap Up with a Quick Comparison Table:**

| **Category** | **Examples** | **Use Case** |
| --- | --- | --- |
| Arithmetic | +, -, \* | Math operations |
| Comparison | ==, !=, < | If conditions, logic |
| Logical | and, or, not | Combining conditions |
| Bitwise | &, ` | , ^` |

## **✅ Real-Time Examples Using Operators**

### **🧮 1. Calculate Total Bill with Tax & Discount (Arithmetic + Comparison)**

**Problem:**You’re building a billing system for a store.  
If the total is above ₹1000, apply 10% discount.

amount = 1200

tax = amount \* 0.18 # 18% tax

total = amount + tax

# Apply discount if total > 1000

if total > 1000:

discount = total \* 0.10

total -= discount

print("Final bill:", total)

✅ Uses:

* \*, +, - → Arithmetic
* > → Comparison

### **🎟️ 3. Movie Ticket Discount System (Logical + Comparison)**

**Problem:**If the user is either a **student** or **senior citizen**, give discount.

age = 65

student = ‘yes’

if age >= 60 or student==’yes’:

print("You get a discount!")

else:

print("No discount")

✅ Uses:

* >= → Comparison
* or → Logical

### **About the Author**

**Gowtham SB** is a **Data Engineering expert, educator,** **and content creator** with a passion for **big data technologies, as well as cloud and Gen AI** . With years of experience in the field, he has worked extensively with **cloud platforms, distributed systems, and data pipelines**, helping professionals and aspiring engineers master the art of data engineering.

Beyond his technical expertise, Gowtham is a **renowned mentor and speaker**, sharing his insights through engaging content on **YouTube and LinkedIn**. He has built one of the **largest Tamil Data Engineering communities**, guiding thousands of learners to excel in their careers.

Through his deep industry knowledge and hands-on approach, Gowtham continues to **bridge the gap between learning and real-world implementation**, empowering individuals to build **scalable, high-performance data solutions**.

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🎥𝐘𝐨𝐮𝐓𝐮𝐛𝐞 - https://www.youtube.com/@dataengineeringvideos

📸𝐈𝐧𝐬𝐭𝐚𝐠𝐫𝐚𝐦 - <https://instagram.com/dataengineeringtamil>

📸𝐈𝐧𝐬𝐭𝐚𝐠𝐫𝐚𝐦 - [https://instagram.com/](https://instagram.com/dataengineeringtamil)thedatatech.in

🤝𝐂𝐨𝐧𝐧𝐞𝐜𝐭 𝐟𝐨𝐫 𝟏:𝟏 - https://topmate.io/dataengineering/

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🌐𝐖𝐞𝐛𝐬𝐢𝐭𝐞 - https://codewithgowtham.blogspot.com

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