SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

19IT103 – COMPUTATIONAL THINKING AND PYTHON PROGRAMMING

❖ A readable, dynamic, pleasant, flexible, fast and powerful language

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS

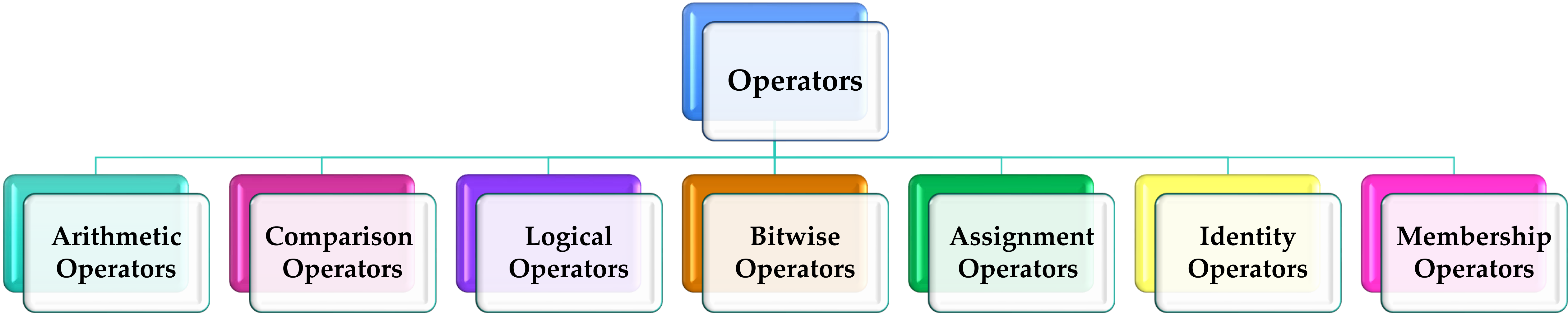
Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string , and list; variables, expressions, statements, tuple assignment, **precedence of operators**, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

Recap

- Expressions
- Statement
- Tuple Assignment

Operators

- Python Operators in general are used to **perform operations** on **values and variables**.



Operators

- Arithmetic Operators
- Comparison Operators
- Logical Operators
- Bitwise Operators
- Assignment Operators
- Identity Operators
- Membership Operators

Arithmetic Operators

- Arithmetic operators are used to performing **mathematical operations** like **addition, subtraction, multiplication, and division**.
- There are 7 arithmetic operators in Python :
  - **Addition (+)**
  - **Subtraction (-)**
  - **Multiplication (*)**
  - **Division (/)**
  - **Modulus (%)**
  - **Exponentiation (**)**
  - **Floor division(//)**

Arithmetic Operators

Operator	Description	Syntax
+	Addition: adds two operands	x + y
–	Subtraction: subtracts two operands	x – y
*	Multiplication: multiplies two operands	x * y
/	Division (float): divides the first operand by the second	x / y
//	Division (floor): divides the first operand by the second	x // y
%	Modulus: returns the remainder when the first operand is divided by the second	x % y
**	Power: Returns first raised to power second	x ** y

Arithmetic Operator - Example

Comparison/Relational Operators

- Comparison of Relational operators **compares the values**. It either **returns True or False** according to the condition.

- There are 6 comparison operators in Python :
  - **Greater than (>)**
  - **Less than (<)**
  - **Equal to (==)**
  - **Not equal to (!=)**
  - **Greater than or equal to (>=)**
  - **Less than or equal to (<=)**

Comparison/Relational Operators

Operator	Description	Syntax
>	Greater than: True if the left operand is greater than the right	x > y
<	Less than: True if the left operand is less than the right	x < y
==	Equal to: True if both operands are equal	x == y
!=	Not equal to – True if operands are not equal	x != y
>=	Greater than or equal to: True if left operand is greater than or equal to the right	x >= y
<=	Less than or equal to: True if left operand is less than or equal to the right	x <= y

Relational Operator - Example

Logical Operators

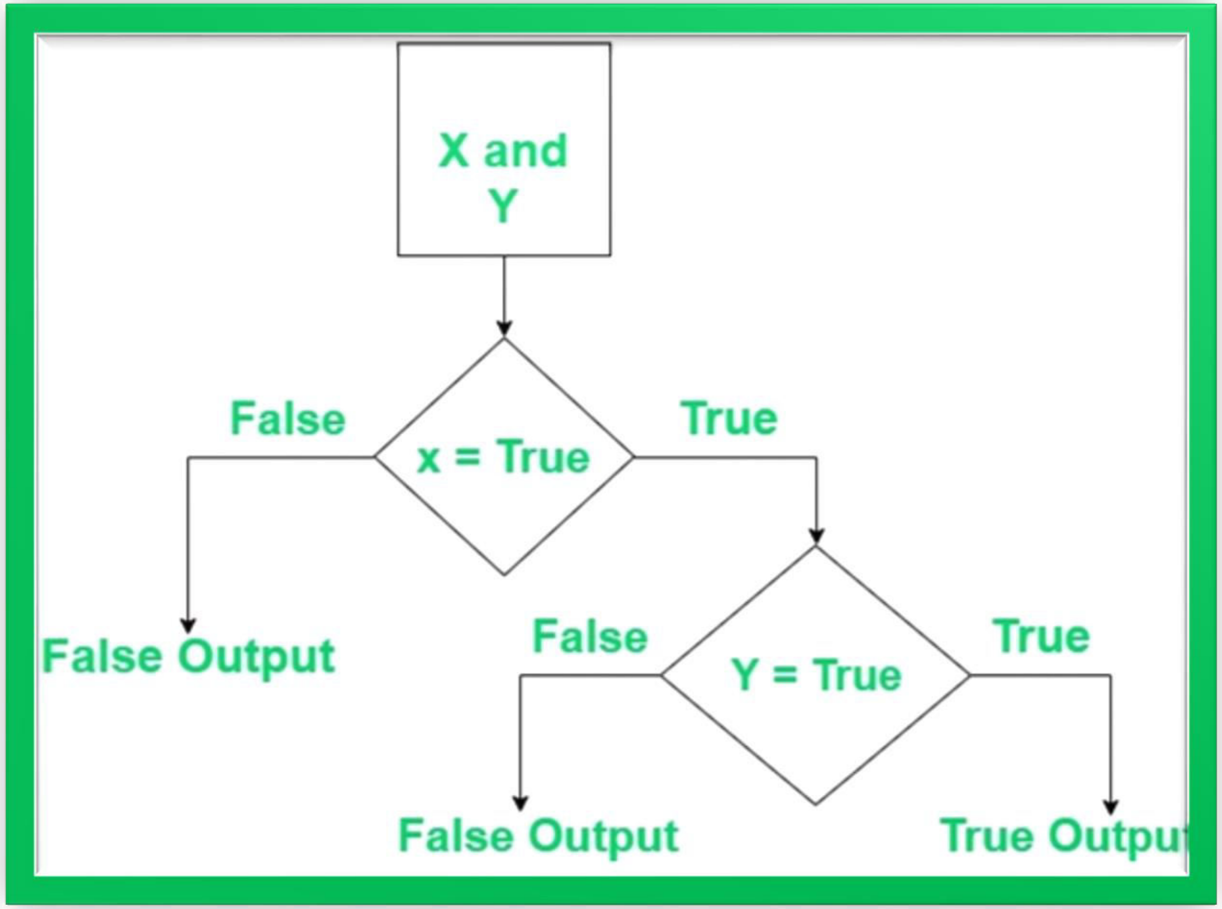
- Logical operators perform **Logical AND, Logical OR, and Logical NOT operations**.
- It is used to **combine conditional statements**.
- There are 3 basic logical operators in Python :
  - **and**
  - **or**
  - **not**

Logical Operators

Operator	Description	Syntax
and	Logical AND: True if both the operands are true	x and y
or	Logical OR: True if either of the operands is true	x or y
not	Logical NOT: True if the operand is false	not x

Logical AND

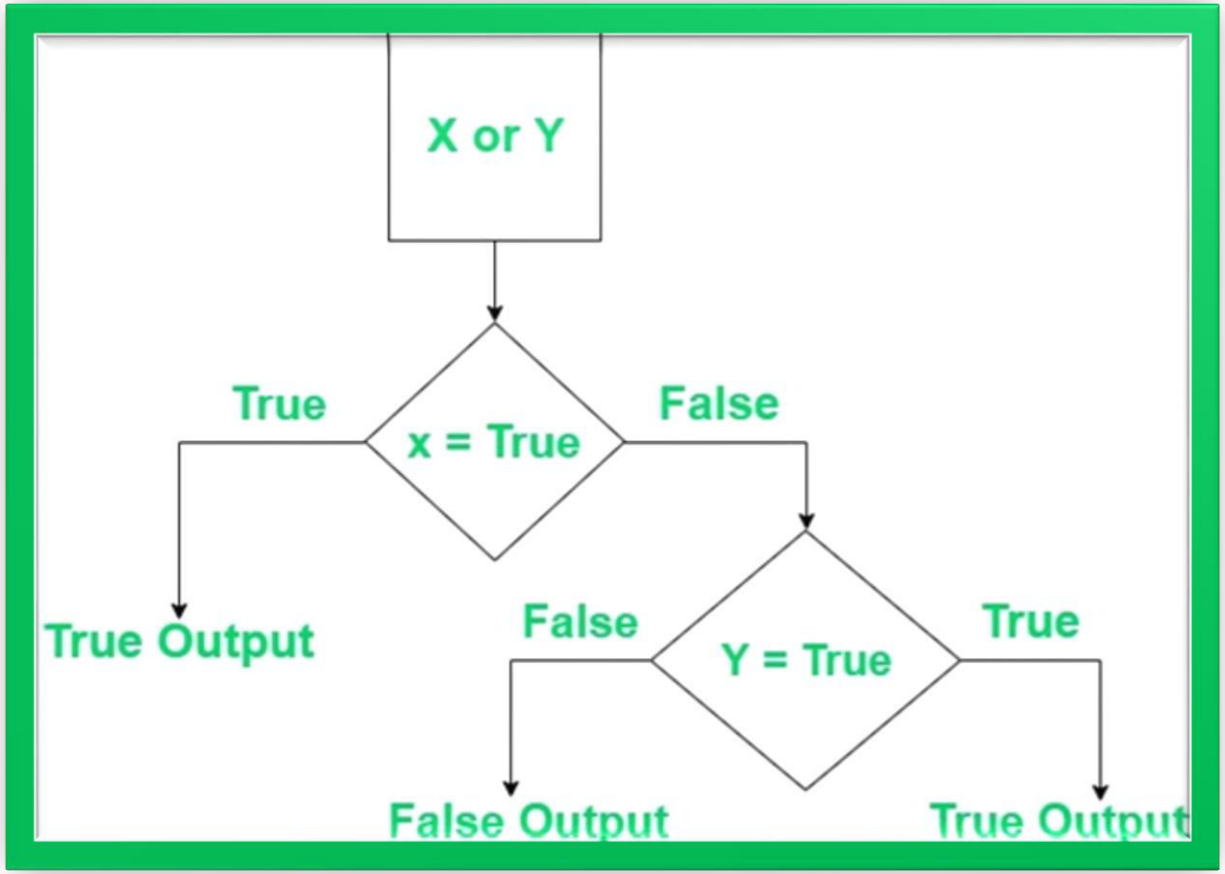
- Logical operator returns True if both the operands are True else it returns False.



Logical AND- Example

Logical OR

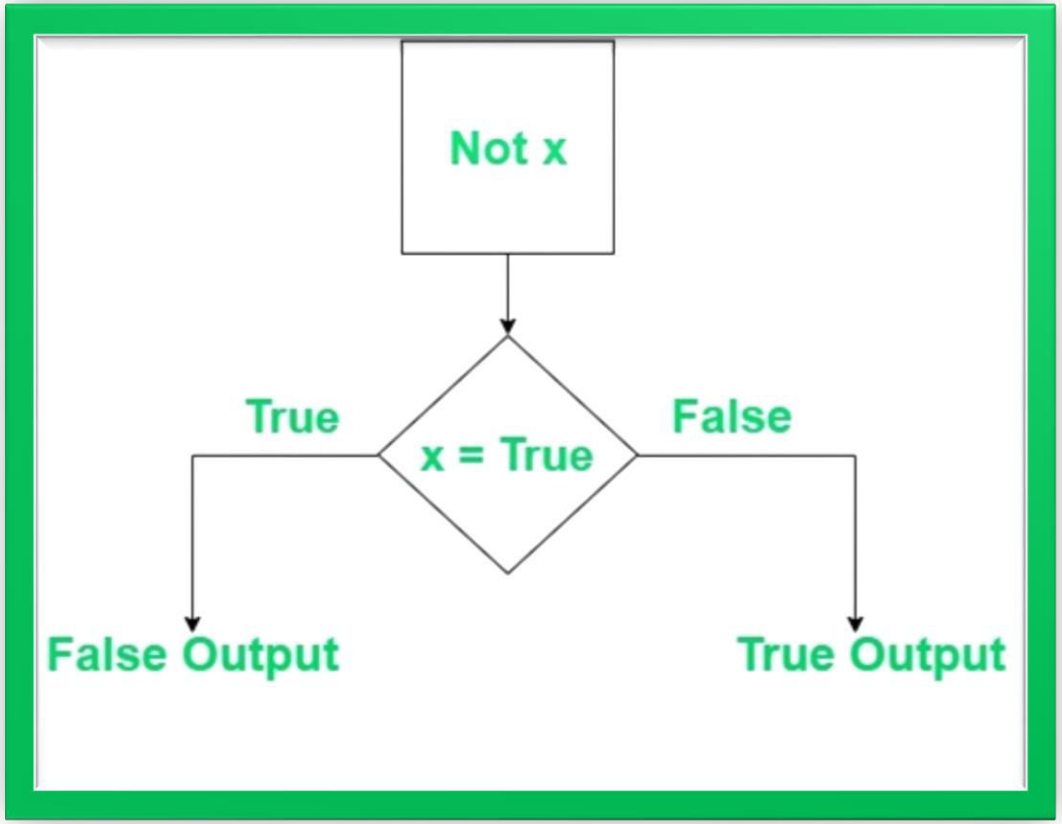
- Logical or operator returns True if either of the operands is True.



Logical OR- Example

Logical NOT

- Logical or operator returns True if either of the operands is True.



Logical NOT - Example

Bitwise Operators

- Bitwise operators act on bits and perform the **bit-by-bit operations**.
- These are used to operate on binary numbers.
- The integers are first **converted into binary** and then operations are performed on **bit by bit**, hence the name bitwise operators.
- Then the result is returned in **decimal format**.

Bitwise Operators

Operator	Description	Syntax
&	Bitwise AND	x & y
|	Bitwise OR	x | y
~	Bitwise NOT	~x
^	Bitwise XOR	x ^ y
>>	Bitwise right shift	x>>
<<	Bitwise left shift	x<<

Bitwise Operator - Example

Assignment Operators

- Assignment operators are used to assigning values to the variables.

Operator	Description	Syntax
=	Assign value of right side of expression to left side operand	x = y + z
+=	Add and Assign: Add right side operand with left side operand and then assign to left operand	a += b
-=	Subtract AND: Subtract right operand from left operand and then assign to left operand: True if both operands are equal	a -= b
*=	Multiply AND: Multiply right operand with left operand and then assign to left operand	a *= b
/=	Divide AND: Divide left operand with right operand and then assign to left operand	a /= b
%=	Modulus AND: Takes modulus using left and right operands and assign result to left operand	a %= b

Assignment Operators

Operator	Description	Syntax
//=	Divide(floor) AND: Divide left operand with right operand and then assign the value(floor) to left operand	a //= b
**=	Exponent AND: Calculate exponent(raise power) value using operands and assign value to left operand	a **= b
&=	Performs Bitwise AND on operands and assign value to left operand	a &= b
|=	Performs Bitwise OR on operands and assign value to left operand	a |= b
^=	Performs Bitwise xOR on operands and assign value to left operand	a ^= b
>>=	Performs Bitwise right shift on operands and assign value to left operand	a >>= b
<<=	Performs Bitwise left shift on operands and assign value to left operand	a <<= b

Assignment Operator - Example