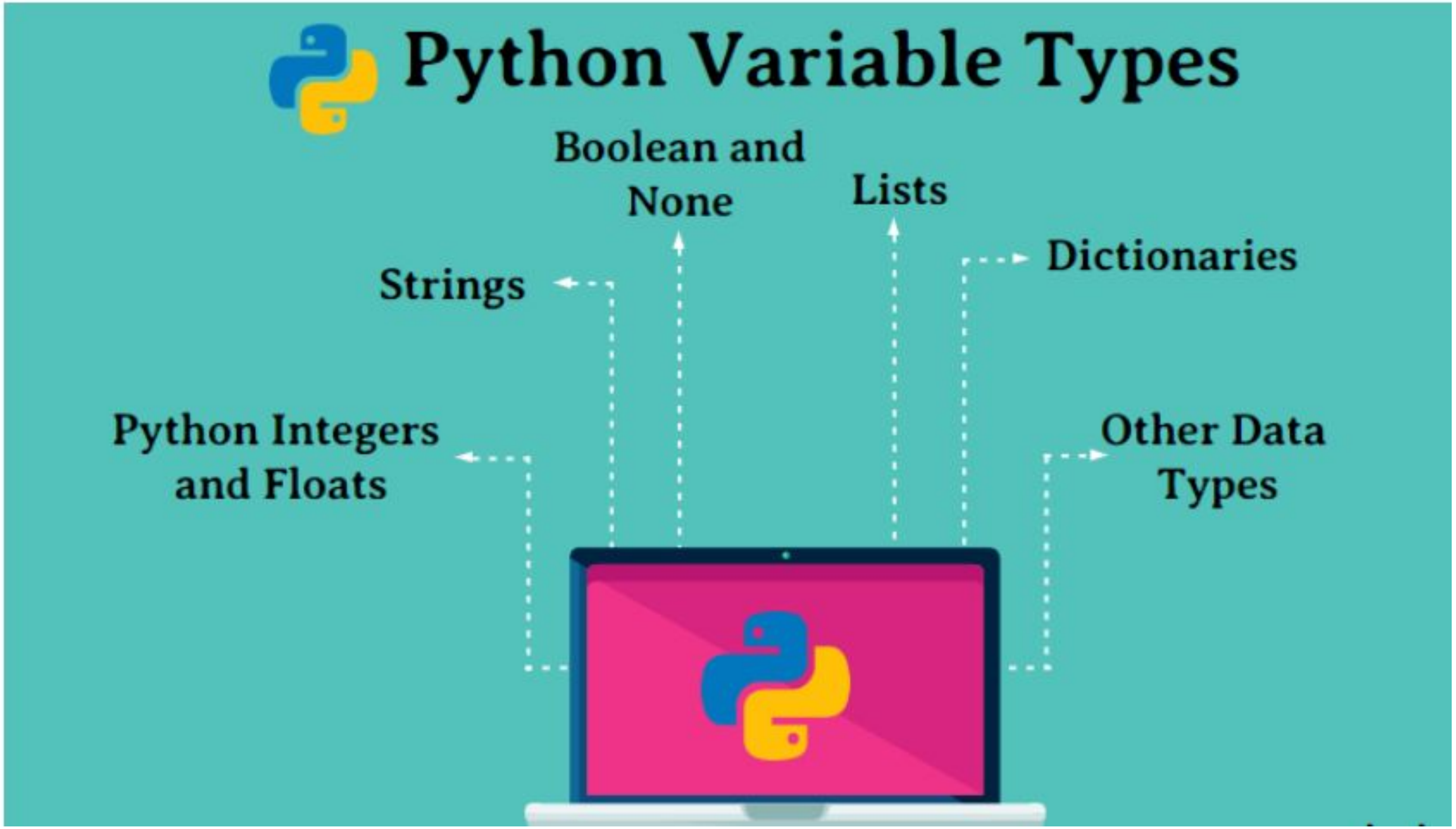
Python

- Variables in python
- Data Types in Python
- User Input
- Operators

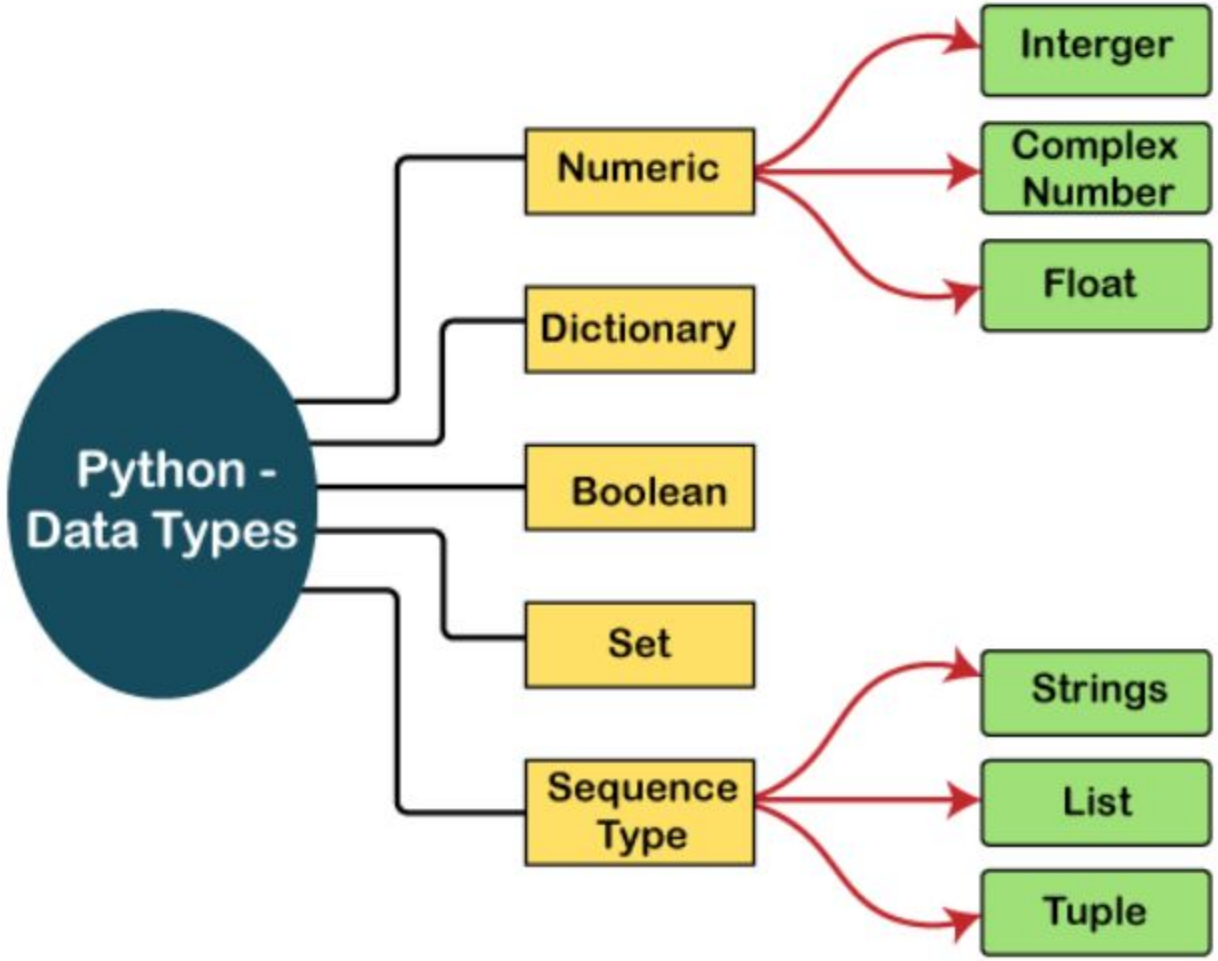

Python Variable Types
Boolean and None
Lists
Strings
Dictionaries
Python Integers and Floats
Other Data Types

In Python, it is not necessary to declare a type anywhere. In fact, you would declare variables like this.

```
# Python
Result = 24
name = "John"
```

The standard data types of python are given below:

- **Numbers:** The Number data type is used to stores numeric values.
- **String:** The string data type is used to stores the sequence of characters.
- **Tuple:** Tuple data type is used to stores a collection of different data types of elements, and it is immutable.
- **List:** List data type is used to store the collection of different data types of elements, and it is mutable.
- **Set:** Set data type is used to store different data types of elements; it is mutable and stores unique elements.
- **Dictionary:** Dictionary data type is used to store a collection of different data types of elements in the form of key-value pairs; it is mutable and stores the unique key.


Python - Data Types
Numeric
Dictionary
Boolean
Set
Sequence Type
Interger
Complex Number
Float
Strings
List
Tuple

Numbers

Number stores numeric values. The integer, float, and complex values belong to a Python Numbers data-type. Python provides the **type()** function to know the data-type of the variable.

```python
a = 5
print("The type of a", type(a))

b = 40.5
print("The type of b", type(b))

c = 1+3j
print("The type of c", type(c))
```

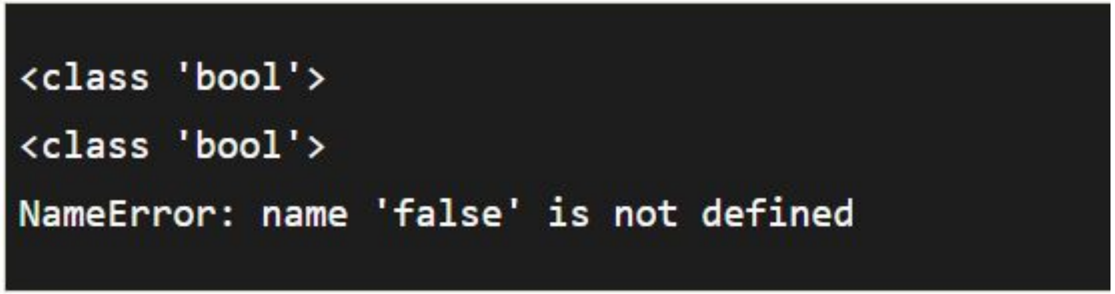
1. **Int -** Integer value can be any length such as integers 10, 2, 29, -20, -150 etc. Python has no restriction on the length of an integer. Its value belongs to **int**
2. **Float -** Float is used to store floating-point numbers like 1.9, 9.902, 15.2, etc. It is accurate upto 15 decimal points.
3. **complex -** A complex number contains an ordered pair, i.e., x **+** iy where x and y denote the real and imaginary parts, respectively. The complex numbers like 2.14j, 2.0 + 2.3j, etc.

Boolean

Boolean type provides two built-in values, True and False. These values are used to determine the given statement true or false.

```python
print(type(True))
print(type(False))
print(false)
```

Output:



```
<class 'bool'>
<class 'bool'>
NameError: name 'false' is not defined
```

Sequence Type

String

The string can be defined as the sequence of characters represented in the quotation marks. In Python, we can use single, double, or triple quotes to define a string.

String handling in Python is a straightforward task since Python provides built-in functions and operators to perform operations in the string.

In the case of string handling, the operator + is used to concatenate two strings as the operation *"hello"+" python"* returns *"hello python"*.

```
str = "string using double quotes"
print(str)
Str_2 = ‘string using single quotes’
s = '''A multiline
string'''
print(s)
```

List

Python Lists are similar to arrays in C. However, the list can contain data of different types. The items stored in the list are separated with a comma (,) and enclosed within square brackets **[ ]**.

```
list1  = [1, "hi", "Python", 2]
#Checking type of given list
print(type(list1))

#Printing the list1
print (list1)
```

Tuple

A tuple is similar to the list in many ways. Like lists, tuples also contain the collection of the items of different data types. The items of the tuple are separated with a comma (,) and enclosed in parentheses ().

```
tup  = ("hi", "Python", 2)
# Checking type of tup
print (type(tup))

#Printing the tuple
print (tup)
```

Dictionary

Dictionary is an ordered set of a key-value pair of items.

```python
d = {1:'Jimmy', 2:'Alex', 3:'john', 4:'mike'}

# Printing dictionary
print (d)

# Accesing value using keys
print("1st name is "+d[1])
print("2nd name is "+ d[4])

print (d.keys())
print (d.values())
```

Set

Python Set is the unordered collection of the data type. It is iterable, mutable(can modify after creation), and has unique elements.

```python
set2 = {'James', 2, 3,'Python'}

#Printing Set value
print(set2)
```

Python Operators

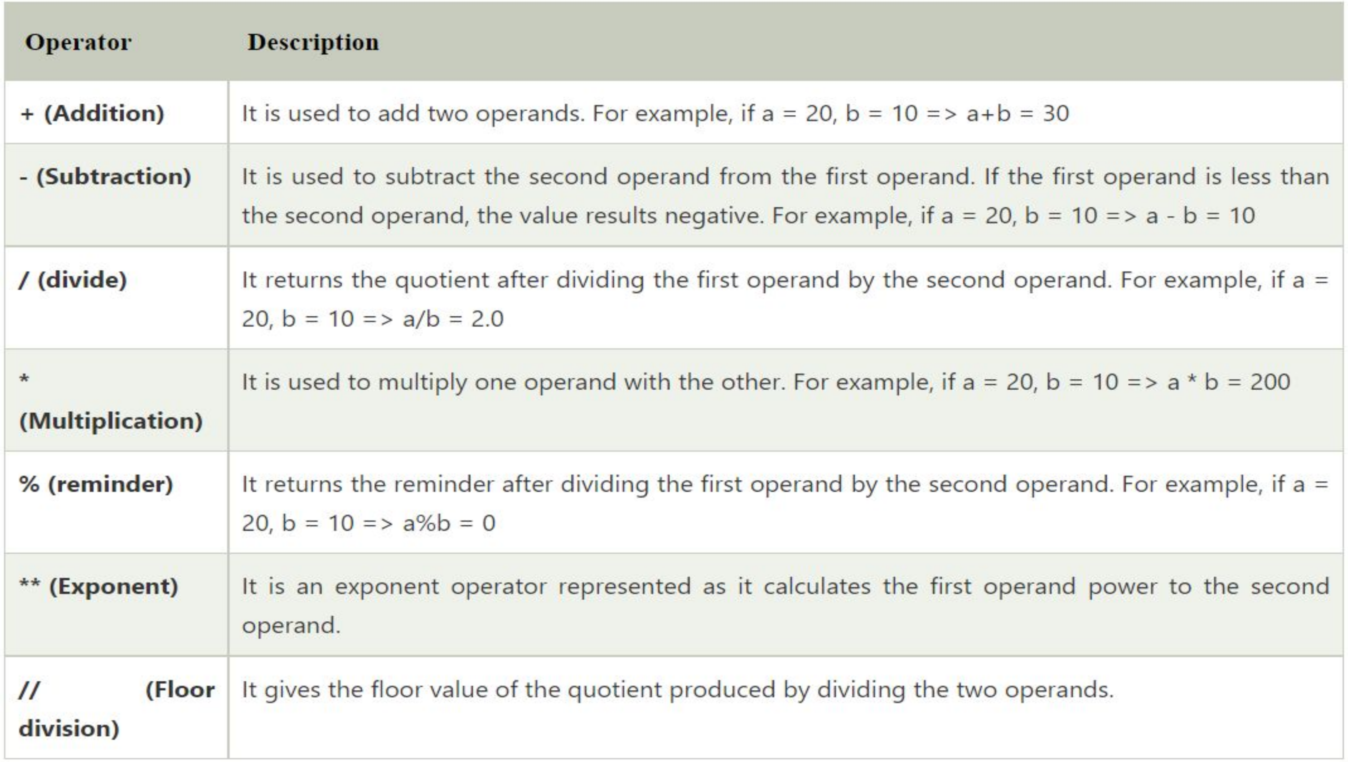
The operator can be defined as a symbol which is responsible for a particular operation between two operands. Operators are the pillars of a program on which the logic is built in a specific programming language. Python provides a variety of operators, which are described as follows.

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

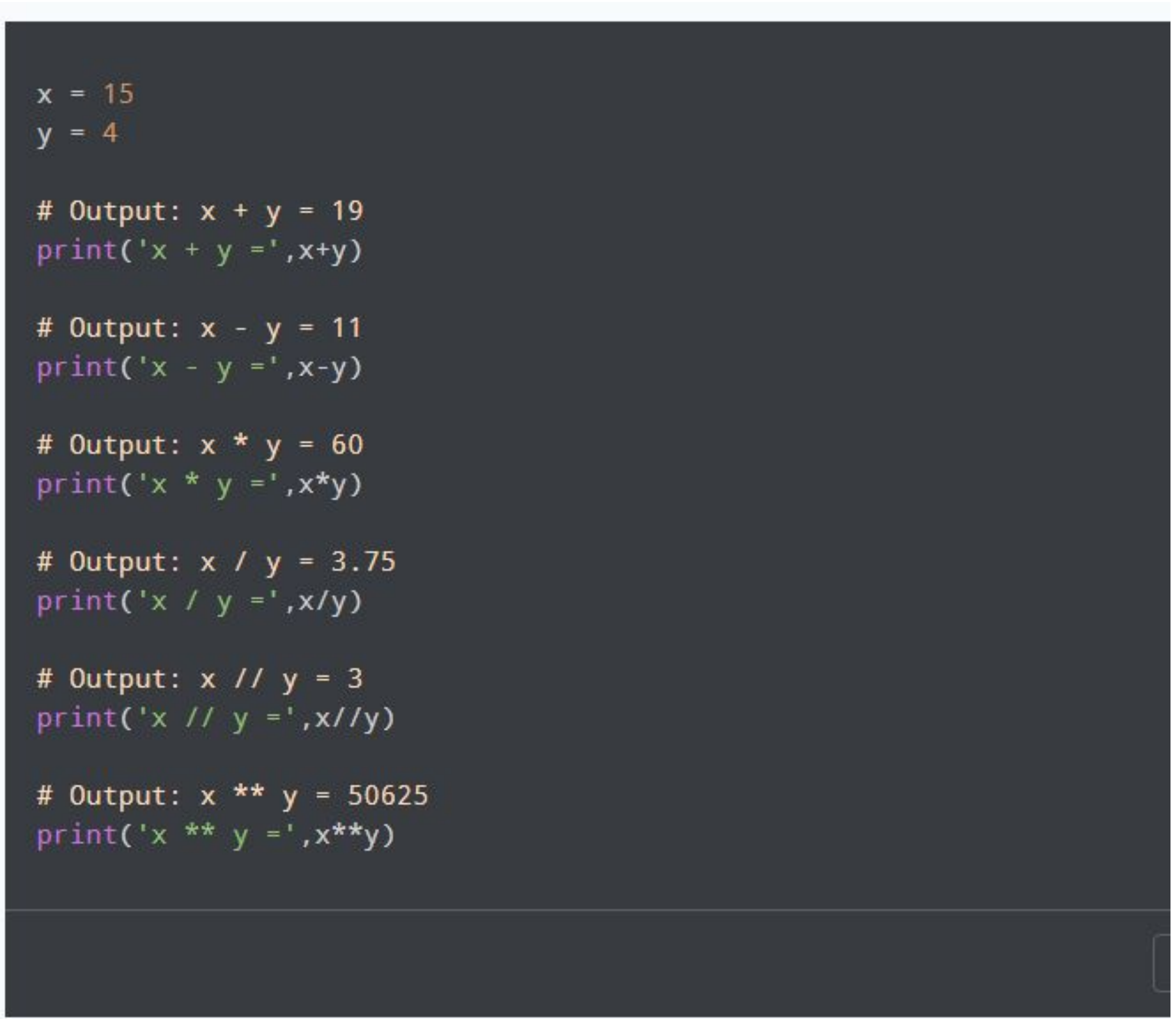
Arithmetic Operators

Arithmetic operators are used to perform arithmetic operations between two operands. It includes + (addition), - (subtraction), *(multiplication), /(divide), %(reminder), //(floor division), and exponent (**) operators.

Consider the following table for a detailed explanation of arithmetic operators.

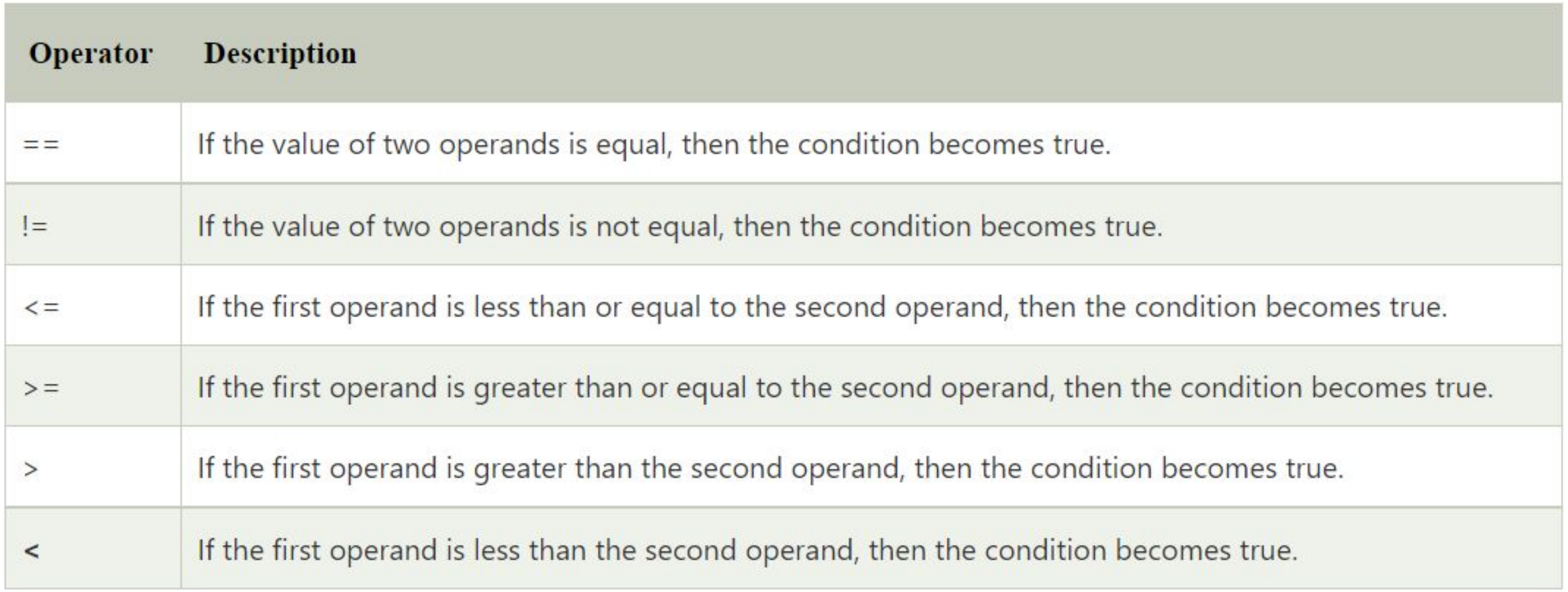


Operator	Description
+ (Addition)	It is used to add two operands. For example, if a = 20, b = 10 => a+b = 30
- (Subtraction)	It is used to subtract the second operand from the first operand. If the first operand is less than the second operand, the value results negative. For example, if a = 20, b = 10 => a - b = 10
/ (divide)	It returns the quotient after dividing the first operand by the second operand. For example, if a = 20, b = 10 => a/b = 2.0
*** (Multiplication)**	It is used to multiply one operand with the other. For example, if a = 20, b = 10 => a * b = 200
% (reminder)	It returns the reminder after dividing the first operand by the second operand. For example, if a = 20, b = 10 => a%b = 0
**** (Exponent)**	It is an exponent operator represented as it calculates the first operand power to the second operand.
// (Floor division)	It gives the floor value of the quotient produced by dividing the two operands.

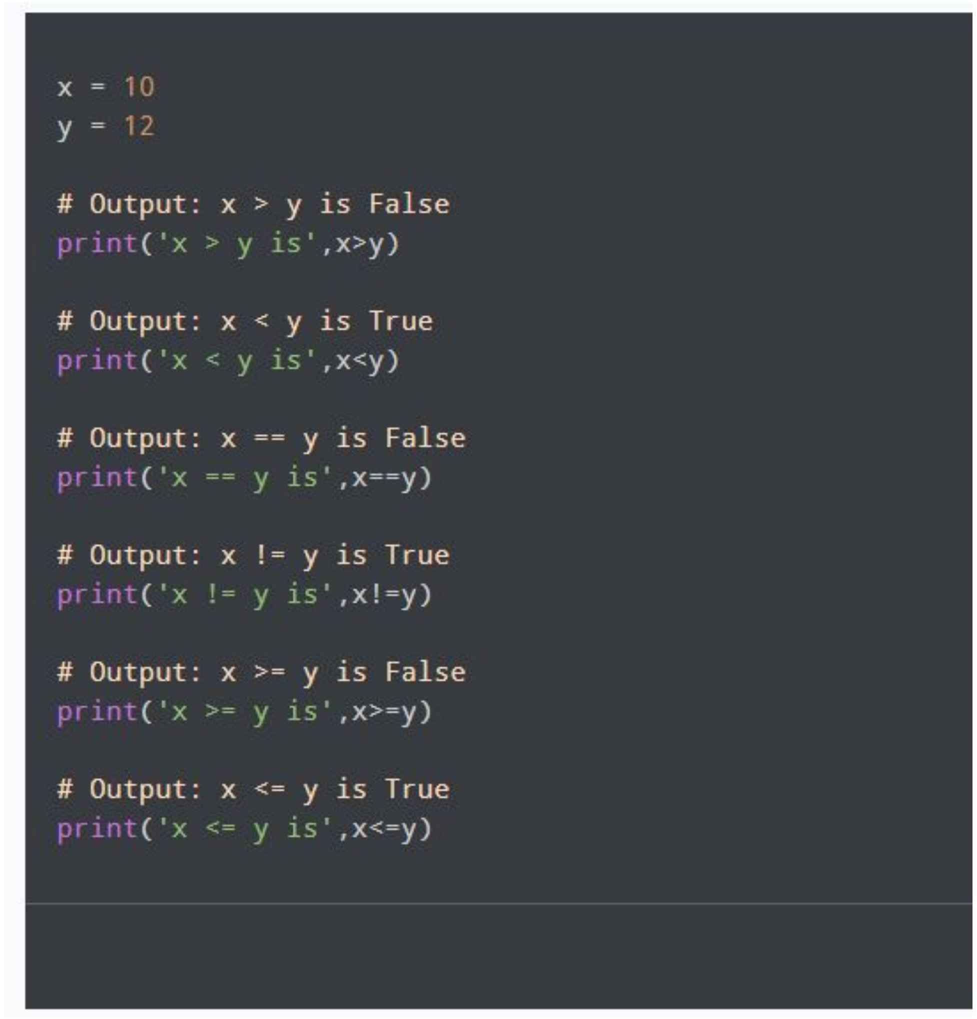

```
x = 15
y = 4

# Output: x + y = 19
print('x + y =',x+y)

# Output: x - y = 11
print('x - y =',x-y)

# Output: x * y = 60
print('x * y =',x*y)

# Output: x / y = 3.75
print('x / y =',x/y)

# Output: x // y = 3
print('x // y =',x//y)

# Output: x ** y = 50625
print('x ** y =',x**y)
```

Comparison operator

Comparison operators are used to comparing the value of the two operands and returns Boolean true or false accordingly. The comparison operators are described in the following table.



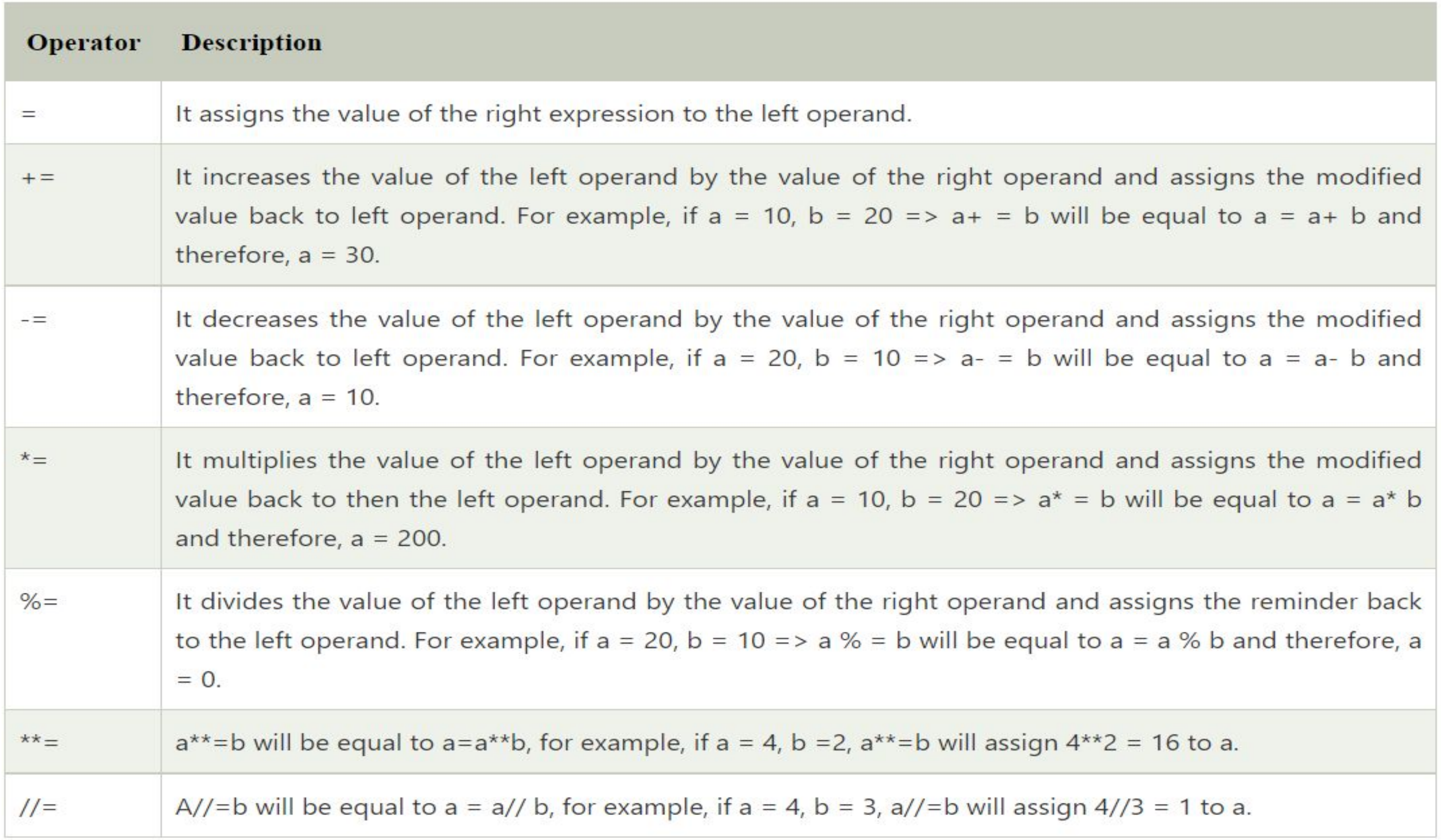
Operator	Description
==	If the value of two operands is equal, then the condition becomes true.
!=	If the value of two operands is not equal, then the condition becomes true.
<=	If the first operand is less than or equal to the second operand, then the condition becomes true.
>=	If the first operand is greater than or equal to the second operand, then the condition becomes true.
>	If the first operand is greater than the second operand, then the condition becomes true.
<	If the first operand is less than the second operand, then the condition becomes true.



```
x = 10
y = 12

# Output: x > y is False
print('x > y is',x>y)

# Output: x < y is True
print('x < y is',x<y)

# Output: x == y is False
print('x == y is',x==y)

# Output: x != y is True
print('x != y is',x!=y)

# Output: x >= y is False
print('x >= y is',x>=y)

# Output: x <= y is True
print('x <= y is',x<=y)
```

Assignment Operators

The assignment operators are used to assign the value of the right expression to the left operand. The assignment operators are described in the following table.



Operator	Description
=	It assigns the value of the right expression to the left operand.
+=	It increases the value of the left operand by the value of the right operand and assigns the modified value back to left operand. For example, if a = 10, b = 20 => a+ = b will be equal to a = a+ b and therefore, a = 30.
-=	It decreases the value of the left operand by the value of the right operand and assigns the modified value back to left operand. For example, if a = 20, b = 10 => a- = b will be equal to a = a- b and therefore, a = 10.
*=	It multiplies the value of the left operand by the value of the right operand and assigns the modified value back to then the left operand. For example, if a = 10, b = 20 => a* = b will be equal to a = a* b and therefore, a = 200.
%=	It divides the value of the left operand by the value of the right operand and assigns the reminder back to the left operand. For example, if a = 20, b = 10 => a % = b will be equal to a = a % b and therefore, a = 0.
**=	a**=b will be equal to a=a**b, for example, if a = 4, b =2, a**=b will assign 4**2 = 16 to a.
//=	A//=b will be equal to a = a// b, for example, if a = 4, b = 3, a//=b will assign 4//3 = 1 to a.

Operator	Example	Equivalent to
=	x = 5	x = 5
+=	x += 5	x = x + 5
-=	x -= 5	x = x - 5
*=	x *= 5	x = x * 5
/=	x /= 5	x = x / 5
%=	x %= 5	x = x % 5
//=	x //= 5	x = x // 5
**=	x **= 5	x = x ** 5