

## Introduction To Python

### ➤ What is Python

**Python** is a general purpose, dynamic, high-level, and interpreted programming language. It supports Object Oriented programming approach to develop applications. It is simple and easy to learn and provides lots of high-level data structures.

Python is *easy to learn* yet powerful and versatile scripting language, which makes it attractive for Application Development.

Python is an interpreted scripting language also. **Guido Van Rossum** is known as the founder of Python programming.

### ➤ Features of Python

- Easy to use and Learn
- Expressive Language
- Interpreted Language
- Object-Oriented Language
- Open-Source Language
- Extensible
- Learn Standard Library
- GUI Programming Support
- Integrated
- Embeddable
- Dynamic Memory Allocation
- Wide Range of Libraries and Frameworks

## ➤ Python Application Areas

- Desktop Applications
- Game Development
- Web applications
- Web scraping
- Data analysis
- Machine learning
- Image processing
- Graphics design
- Operating Systems
- Language Development
- Network programming

## ➤ Download and Install Python

The .exe file for Python can be downloaded from

<https://www.python.org/downloads/>

Run the exe file and install Python

Add path during installation

## ➤ Identifiers & Variables

The names we choose for variables, functions, classes or modules are commonly known as Identifiers. In python Identifiers must obey the following rules.

- All identifiers must start with letter or underscore ( \_ ), you can't use digits.
- Identifiers can contain letters, digits and underscores ( \_ ).
- They can be of any length.
- Identifier can't be a keyword.

## ➤ Keywords / Reserved Words

Python keywords are unique words reserved with defined meanings and functions that we can only apply for those functions. You'll never need to import any keyword into your program because they're permanently present.

False	await	else	import	pass
None	break	except	in	raise
True	class	finally	is	return
and	continue	for	lambda	try
as	def	from	nonlocal	while
assert	del	global	not	with
async	elif	if	or	yield

## ➤ Python Variables

- Variable is a name that is used to refer to memory location. Python variable is also known as an identifier and used to hold value.
- In Python, we don't need to specify the type of variable because Python is a infer language and smart enough to get variable type.
- Variable names can be a group of both the letters and digits, but they have to begin with a letter or an underscore.
- It is recommended to use lowercase letters for the variable name. Rahul and rahul both are two different variables.

### **Assigning values to variables:**

```
num = 50           # num is integer
rate = 10.5        # rate is float
```

```
name = "Python"
```

```
# name is string
```

```
x = y = z = 500
```

```
# this statement assign 500 to z, y, x
```

## ➤ Operators in Python

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), %(remainder), //(floor division), and exponent (\*\*) operators.

Operator	Meaning	Example	Result
+	Addition	3 + 4	7
-	Subtraction	7 - 3	4

*	Product	$7 * 3$	21
/	Float division	$5/2$	2.5
//	Integer division	$5//2$	2
**	Exponentiation	$2**3$	8
%	Remainder	$10\%3$	1

### Comparison operators

Comparison operators are used to comparing the value of the two operands and returns Boolean true or false accordingly.

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.

## Assignment Operators

The assignment operators are used to assign the value of the right expression to the left operand.

Operator	Meaning	Example
=	Assigns values from right side operands to left side operand	c=a+b
+=	It adds right operand to the left operand and assign the result to left operand	a+=b
-=	It subtracts right operand from the left operand and assign the result to left operand	a-=b
*=	It multiplies right operand with the left operand and assign the result to left operand	a*=b
/=	It divides left operand with the right operand and assign the result to left operand	a/=b
**=	Performs exponential (power) calculation on operators and assign value to the left operand	a**=b
//=	It performs floor division on operators and assign value to the left operand	a//=b
%=	It takes modulus using two operands and assign the result to left operand	a%=b

## Logical Operators

The logical operators are used primarily in the expression evaluation to make a decision.

Operator	Meaning	Example
and	Returns True if both operands are True	x and y
or	Returns True if at least one operand is True	x or y
not	Returns True if operand is False	not x

## Bitwise Operator

The bitwise operators perform bit by bit operation on the values of the two operands.

- Bitwise operator works on bits and performs bit by bit operation. Assume if  $a = 60$ ; and  $b = 13$ ; Now in binary format they will be as follows –

**a = 0011 1100**

**b = 0000 1101**

**a & b = 0000 1100**

**a | b = 0011 1101**

**a ^ b = 0011 0001**

**~a = 1100 0011**

## Membership Operator

Python membership operators are used to check the membership of value inside a Python data structure. If the value is present in the data structure, then the resulting value is true otherwise it returns false.

Operator	Description
in	It is evaluated to be true if the first operand is found in the second operand (list, tuple, or dictionary).
not in	It is evaluated to be true if the first operand is not found in the second operand (list, tuple, or dictionary).

## Identity Operator

The identity operators are used to decide whether an element certain class or type.

Operator	Description
is	It is evaluated to be true if the reference present at both sides point to the same object.
is not	It is evaluated to be true if the reference present at both sides do not point to the same object.



## ➤ Comments in Python

- Comments in Python programs are entered using # symbol
- Comments are used to make the program more understandable or readable.
- Comments won't be executed

### Example

```
# this is a program to find the largest of three inputs.
```

## ➤ Reading input

- input() function is used to receive input from the console.

**Syntax:** input([prompt]) -> string

- input() function accepts an optional string argument called prompt and also returns a string.

### Example

```
name=input("Enter your name")
```