# Python:

**Python** is a general-purpose interpreted, interactive, object-oriented, and high-level programming language. It was created by Guido van Rossum during 1985- 1990 at the National Research Institute for Mathematics and Computer Science in the Netherlands. Python source code is now available under the GNU General Public License (GPL). It is available on the official website of Python https://www.python.org.

**Python** programs are executed in two different modes

- ➢ Interactive Mode Programming
- ➢ Script Mode Programming

## Python Features:

- ➢ Easy to Learn and Use
- ➢ Expressive Language
- ➢ Interpreted Language
- ➢ Cross-platform Language
- ➢ Free and Open Source
- ➢ Object-Oriented Language
- ➢ Large Standard Library
- ➢ GUI Programming Support
- ➢ Integrated

## Python Variables

Variable is a name which is used to refer memory location. Variable also known as identifier and used to hold value

## Declaring Variable and Assigning Values

Python does not bound us to declare variable before using in the application. It allows us to create variable at required time. We don't need to declare explicitly variable in Python. When we assign any value to the variable that variable is declared automatically. The equal (=) operator is used to assign value to a variable.

a=30

b="Tiger"

x=y=z=50

### Identifier Naming

Variables are the example of identifiers. An Identifier is used to identify the literals used in the program. The rules to name an identifier are given below.

> ➢ The first character of the variable must be an alphabet or underscore.
> ➢ All the characters except the first character may be an alphabet of lower-case(a-z), upper-case (A-Z), underscore or digit (0-9).
> ➢ Identifier name must not contain any white-space, or special character (!, @, #, %, ^, &, *).
> ➢ Identifier name must not be keyword defined in the language.
> ➢ Identifier names are case sensitive.

### Tokens:

Token is the smallest unit inside the given program.

There are following tokens in Python:

> ➢ Keywords.
> ➢ Identifiers.
> ➢ Literals.
> ➢ Operators.

### Standard data types:

A variable can hold different types of values. For example, a student's name must be stored as a string whereas its roll no  must be stored as an integer.

Python provides various standard data types that define the storage method on each of them. The data types defined in Python are given below.

> ➢ Numbers
> ➢ String
> ➢ List
> ➢ Tuple
> ➢ Dictionary

### Numbers

Number stores numeric values. Python creates Number objects when a number is assigned to a variable. For example Python supports 4 types of numeric data.

1. int (signed integers like 10, 2, 29, etc.)
2. long (long integers used for a higher range of values like 908090800L, -0x1929292L)
3. float (float is used to store floating point numbers like 1.9, 9.902, 15.2, etc.)
4. complex (complex numbers like 2.14j, 2.0 + 2.3j, etc.)

A complex number contains an ordered pair, i.e., x + iy where x and y denote the real and imaginary parts respectively).

## 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.

In the case of string handling, the operator + is used to concatenate two strings

The operator * is known as repetition operator as the operation

Print("Hello " *2)       will print  Hello Hello Hello

> str1 = Welcome'                #string str1

> str2 = ' Python '              #string str2

> print (str1[0:2])              #printing first two character using slice operator

> print (str1[4])               #printing 4th character of the string

> print (str1*2)                #printing the string twice

> print (str1 + str2)           #printing the concatenation of str1 and str2

## List

The list can contain data of different types. The items stored in the list are separated with a comma (,) and enclosed within square brackets [].

We can use slice [:] operators to access the data of the list. The concatenation operator (+) and repetition operator (*) works with the list in the same way as they were working with the strings.

> L  = [3,'Vaishali',3.5,'Jaipur']

> print (L[3:]);

> print (L[0:2]);

> print (l * 3);

## Tuples:

Tuple is another form of collection where different type of data can be stored.

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 ().

> T  = (3,'Vaishali',3.5,'Jaipur')

> print (T[3:]);

> print (T[0:2]);

> print (T * 3);

## Dictionary:

Dictionary is a collection which works on a key-value pair. It works like an associated array where no two keys can be same. Dictionaries are enclosed by curly braces {} and values can be retrieved by square bracket[].

➢ d = {1:'Amit', 2:'Sumit', 3:'Raj', 4:'Rohan'};

➢ print("1st name is "+d[1]);

➢ print (d.keys());

➢ print (d.values());

## Python Keywords:

Python Keywords are special reserved words which convey a special meaning to the compiler/interpreter. Each keyword have a special meaning and a specific operation. These keywords can't be used as variable.

Following is the List of Python Keywords.

| True | False | None | and | as |
|---|---|---|---|---|
| asset | def | class | continue | break |
| else | finally | elif | del | except |
| global | for | if | from | import |
| raise | try | or | return | pass |
| nonlocal | in | not | is | lambda |

## Python Operators

The operator can be defined as a symbol which is responsible for a particular operation between two operands. Python operators are.

➢ Arithmetic operators

➢ Comparison operators

➢ Assignment Operators

➢ Logical Operators

➢ Bitwise Operators

➢ Membership Operators

➢ Identity Operators

## Python Comments

**Single Line Comment:**

In case user wants to specify a single line comment, then comment must start with ?#?

```
# This is single line comment.
Print( "Hello Python"  )
```

**Multi Line Comment:**

Multi lined comment can be given inside triple quotes.
```
""" This
    Is
    Multipline comment'''
```

## Indentation in Python:

In Python, indentation is used to declare a block. If two statements are at the same indentation level, then they are the part of the same block.