1. DATA TYPES IN PYTHON :

## Data types in Python

Every value in Python has a datatype. Since everything is an object in Python programming, data types are actually classes and variables are instance (object) of these classes.

There are various data types in Python :

Integers, floating point numbers and complex numbers fall under [Python numbers](https://www.programiz.com/python-programming/numbers) category. They are defined as int, float and complex classes in Python.

We can use the type() function to know which class a variable or a value belongs to. Similarly, the isinstance() function is used to check if an object belongs to a particular class.

Integers can be of any length, it is only limited by the memory available.

A floating-point number is accurate up to 15 decimal places. Integer and floating points are separated by decimal points. 1 is an integer, 1.0 is a floating-point number.

Complex numbers are written in the form, x + yj, where x is the real part and y is the imaginary part.

## Python List

[List](https://www.programiz.com/python-programming/list) is an ordered sequence of items. It is one of the most used datatype in Python and is very flexible. All the items in a list do not need to be of the same type.

Declaring a list is pretty straight forward. Items separated by commas are enclosed within brackets [ ].

Lists are mutable, meaning, the value of elements of a list can be altered.

## Python Tuple

[Tuple](https://www.programiz.com/python-programming/tuple) is an ordered sequence of items same as a list. The only difference is that tuples are immutable. Tuples once created cannot be modified.

Tuples are used to write-protect data and are usually faster than lists as they cannot change dynamically.

It is defined within parentheses () where items are separated by commas.

## Python Strings

[String](https://www.programiz.com/python-programming/string) is sequence of Unicode characters. We can use single quotes or double quotes to represent strings. Multi-line strings can be denoted using triple quotes, ''' or """.

1. HISTORY OF PYTHON :

# History of Python

[Python](https://www.geeksforgeeks.org/python-programming-language/) is a widely used general-purpose, high-level programming language. It was initially designed by Guido van Rossum in 1991 and developed by Python Software Foundation. It was mainly developed for emphasis on code readability, and its syntax allows programmers to express concepts in fewer lines of code.

Python developer, Rossum always wanted the name of his new language to be short, unique, and mysterious.

Inspired by Monty Python’s Flying Circus, a BBC comedy series, he named it **Python**.

1. OPERATORS IN PYTHON :

Operators are used to perform operations on variables and values.

Python divides the operators in the following groups:

* Arithmetic operators
* Assignment operators
* Comparison operators
* Logical operators
* Identity operators
* Membership operators

ARITHMETIC OPERATIONS :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Name** | **Example** |  | **Try it** |
| + | Addition | x + y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_add" \t "https://www.w3schools.com/python/_blank) |
| - | Subtraction | x - y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_sub" \t "https://www.w3schools.com/python/_blank) |
| \* | Multiplication | x \* y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_mult" \t "https://www.w3schools.com/python/_blank) |
| / | Division | x / y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_div" \t "https://www.w3schools.com/python/_blank) |
| % | Modulus | x % y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_mod" \t "https://www.w3schools.com/python/_blank) |
| \*\* | Exponentiation | x \*\* y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_exp" \t "https://www.w3schools.com/python/_blank) |
| // | Floor division | x // y |  | [Try it »](https://www.w3schools.com/python/trypython.asp?filename=demo_oper_floordiv" \t "https://www.w3schools.com/python/_blank) |

ASSINGMENT OPERATORS :

|  |  |  |  |
| --- | --- | --- | --- |
| **Operator** | **Example** |  |  |
| = | x = 5 |  |  |
| += | x += 3 |  |  |
| -= | x -= 3 |  |  |
| \*= | x \*= 3 |  |  |
| /= | x /= 3 |  |  |
| %= | x %= 3 |  |  |
| //= | x //= 3 |  |  |
| \*\*= | x \*\*= 3 |  |  |
| &= | x &= 3 |  |  |
| |= | x |= 3 |  |  |
| ^= | x ^= 3 |  |  |
| >>= | x >>= 3 |  |  |
| <<= |  |  |  |

CONDITIONAL OPERATRS :

|  |  |  |
| --- | --- | --- |
| **Operator** | **Name** |  |
| == | Equal |  |
| != | Not equal |  |
| > | Greater than |  |
| < | Less than |  |
| >= | Greater than or equal to |  |
| <= | Less than or equal to |  |

|  |  |
| --- | --- |
| **Operator** | **Description** |
| and | Returns True if both statements are true |
| or | Returns True if one of the statements is true |
| not | Reverse the result, returns False if the result is true |

LOGICAL OPERATORS :

# Python Features

**Python** is a dynamic, high level, free open source and interpreted programming language. It supports object-oriented programming as well as procedural oriented programming.  
In Python, we don’t need to declare the type of variable because it is a dynamic typed language.  
For example, x=10  
here x can be anything such as String, int etc.

### Features in Python

There are many features in Python, some of which are discussed below –

**1.Easy to code:**  
Python is high level programming language.Python is very easy to learn language as compared to other language like c, c#, java script, java etc.It is very easy to code in python language and anybody can learn python basic in few hours or days.It is also developer-friendly language.

**2. Free and Open Source:**  
Python language is freely available .  
  
Since, it is open-source, this means that source code is also available to the public.So you can download it as, use it as well as share it.

**3.Object-Oriented Language:**  
One of the key features of python is Object-Oriented programming.Python supports object oriented language and concepts of classes, objects encapsulation etc.

**4. GUI Programming Support:**  
Graphical Users interfaces can be made using a module such as PyQt5, PyQt4, wxPython or Tk in python.  
PyQt5 is the most popular option for creating graphical apps with Python.

**5. High-Level Language:**  
Python is a high-level language.When we write programs in python, we do not need to remember the system architecture, nor do we need to manage the memory.

**6.Extensible feature:**  
Python is a **Extensible** language.we can write our some python code into c or c++ language and also we can compile that code in c/c++ language.

**7. Python is Portable language:**  
Python language is also a portable language.for example, if we have python code for windows and if we want to run this code on other platform such as Linux, Unix and Mac then we do not need to change it, we can run this code on any platform.

**8. Python is Integrated language:**  
Python is also an Integrated language because we can easily integrated python with other language like c, c++ etc.

**9. Interpreted Language:**  
Python is an Interpreted Language. because python code is executed line by line at a time. like other language c, c++, java etc there is no need to compile python code this makes it easier to debug our code.The source code of python is converted into an immediate form called **bytecode**.

**10. Large Standard Library**  
Python has a large standard library which provides rich set of module and functions so you do not have to write your own code for every single thing.There are many libraries present in python for such as regular expressions, unit-testing, web browsers etc.

**11. Dynamically Typed Language:**  
Python is dynamically-typed language. That means the type (for example- int, double, long etc) for a variable is decided at run time not in advance.because of this feature we don’t need to specify the type of variable.

## Interactive Python

Python is interactive. When a Python statement is entered, and is followed by the Return key, if appropriate, the result will be printed on the screen, immediately, in the next line. This is particularly advantageous in the debugging process.

## Interpreted Python

Unlike C/C++ etc, Python is an **interpreted object-oriented programming language**. By interpreted it is meant that each time a program is run the interpreter checks through the code for errors and then interprets the instructions into machine-readable bytecode.

An interpreter is a translator in computer's language which translates the given code line-by-line in machine readable bytecodes. And if any error is encounterd it stops the translation until the error is fixed. Unlike C language, which is a **compiled programming language**.