# What Is Python?

Python is an open-source interpreted language (like PHP and Ruby) with automatic memory management, exceptions, modules, objects, and threads.

The benefits of Python include its simplicity, portability, extensibility, and built-in data structures. As it’s open-source, there’s also a massive community backing it. Python is best suited for object-oriented programming. It’s dynamically typed, so you won’t have to state the types of variables when you declare them. Unlike C++, it doesn’t have access to public or private specifiers.

Python’s functions are first-class objects that make difficult tasks simple. While you can write code quickly, running it will be comparatively slower than other compiled programming languages.

* Common native data structures in Python are as follows:
* Dictionaries
* Lists
* Sets
* Strings
* Tuples

## Of These, Which Are Mutable, and Which Are Immutable?

Lists, dictionaries, and sets are mutable. This means that you can change their content without changing their identity. Strings and tuples are immutable, as their contents can’t be altered once they’re created.

## When Would You Use a List vs. a Tuple vs. a Set in Python?

A list is a common data type that is highly flexible. It can store a sequence of objects that are mutable, so it’s ideal for projects that demand the storage of objects that can be changed later.

A tuple is similar to a list in Python, but the key difference between them is that tuples are immutable. They also use less space than lists and can only be used as a key in a dictionary. Tuples are a perfect choice when you want a list of constants.

Sets are a collection of unique elements that are used in Python. Sets are a good option when you want to avoid duplicate elements in your list. This means that whenever you have two lists with common elements between them, you can leverage sets to eliminate them.

## What’s the Difference between a For Loop and a While Loop?

In Python, a loop iterates over popular data types (like dictionaries, lists, or strings) while the condition is true. This means that the program control will pass to the line immediately following the loop whenever the condition is false

**For Loop**

In Python (and in almost any other programming language), For Loop is the most common type of loop. For Loop is often leveraged to iterate through the elements of an array.

**While Loop**

While Loop can be used in Python to perform an indefinite number of iterations as long as the condition remains true.

When compared to For Loop, While Loop is inefficient because it’s much slower. This can be attributed to the fact that it checks the condition after each iteration. However, if you need to perform one or more conditional checks in a For Loop, you will want to consider using While Loop instead (as these checks won’t be required).

## What Packages in the Standard Library, Useful for Data Science Work?

This is because Python is a free and open-source language that data professionals could easily use to develop tools that would help them complete data tasks more efficiently.

The following packages in the Python Standard Library are very handy for data science projects:

NumPy

[NumPy (or Numerical Python)](http://www.numpy.org/) is one of the principle packages for data science applications. It’s often used to process large multidimensional arrays, extensive collections of high-level mathematical functions, and matrices. Implementation methods also make it easy to conduct multiple operations with these objects.

There have been many improvements made over the last year that have resolved several bugs and compatibility issues. NumPy is popular because it can be used as a highly efficient multi-dimensional container of generic data. It’s also an excellent library as it makes data analysis simple by processing data faster while using a lot less code than lists.

Pandas

[Pandas](https://pandas.pydata.org/) is a Python library that provides highly flexible and powerful tools and high-level data structures for analysis. Pandas is an excellent tool for data analytics because it can translate highly complex operations with data into just one or two commands.

Pandas comes with a variety of built-in methods for combining, filtering, and grouping data. It also boasts time-series functionality that is closely followed by remarkable speed indicators.

SciPy

[SciPy](https://www.scipy.org/) is another outstanding library for scientific computing. It’s based on NumPy and was created to extend its capabilities. Like NumPy, SciPy’s data structure is also a multidimensional array that’s implemented by NumPy.

The SciPy package contains powerful tools that help solve tasks related to integral calculus, linear algebra, probability theory, and much more.

Recently, this Python library went through some major build improvements in the form of continuous integration into multiple operating systems, methods, and new functions. Optimizers were also updated, and several new [BLAS and LAPACK functions were wrapped](http://markus-beuckelmann.de/blog/boosting-numpy-blas.html).

## Python’s standard library has a wealth of data structures, including:

* Bisect
* Boolean
* Deque
* Float
* Heapq
* Integers

## **What is PEP 8?**

## PEP 8 is a coding convention, a set of recommendation, about how to write your Python code more readable.

## **What is pickling and unpickling?**

Pickle module accepts any Python object and converts it into a string representation and dumps it into a file by using dump function, this process is called pickling. While the process of retrieving original Python objects from the stored string representation is called unpickling.

## **How Python is interpreted?**

Python language is an interpreted language. Python program runs directly from the source code. It converts the source code that is written by the programmer into an intermediate language, which is again translated into machine language that has to be executed.

**How memory is managed in Python?**

* Python memory is managed by Python private heap space. All Python objects and data structures are located in a private heap. The programmer does not have an access to this private heap and interpreter takes care of this Python private heap.
* The allocation of Python heap space for Python objects is done by Python memory manager. The core API gives access to some tools for the programmer to code.
* Python also have an inbuilt garbage collector, which recycle all the unused memory and frees the memory and makes it available to the heap space.

## **What are the tools that help to find bugs or perform static analysis?**

* PyChecker is a static analysis tool that detects the bugs in Python source code and warns about the style and complexity of the bug. Pylint is another tool that verifies whether the module meets the coding standard.

## **How are arguments passed by value or by reference?**

* Everything in Python is an object and all variables hold references to the objects. The references values are according to the functions; as a result you cannot change the value of the references. However, you can change the objects if it is mutable.

## **What is namespace in Python?**

In Python, every name introduced has a place where it lives and can be hooked for. This is known as namespace. It is like a box where a variable name is mapped to the object placed. Whenever the variable is searched out, this box will be searched, to get corresponding object.