

Python

An Introduction to Python

Python is a popular object-oriented programming language having the capabilities of high-level programming language. Its easy to learn syntax and portability capability makes it popular these days. The followings facts gives us the introduction to Python:

- Python was developed by Guido van Rossum at Stichting Mathematisch Centrum in the Netherlands.
- It was written as the successor of programming language named 'ABC'.
- It's first version was released in 1991.
- The name Python was picked by Guido van Rossum from a TV show named Monty Python's Flying Circus.
- It is an open source programming language which means that we can freely download it and use it to develop programs. It can be downloaded from www.python.org.
- Python programming language is having the features of Java and C both. It is having the elegant 'C' code and on the other hand, it is having classes and objects like Java for object-oriented programming.
- It is an interpreted language, which means the source code of Python program would be first converted into bytecode and then executed by Python virtual machine.

Why Python?

Python has become the lingua franca for many data science applications. It combines the power of general-purpose programming languages with the ease of use of domain-specific scripting languages like MATLAB or R. Python has libraries for data loading, visualization, statistics, natural language processing, image processing, and more. This vast toolbox provides data scientists with a large array of general- and special-purpose functionality. One of the main advantages of using Python is the ability to interact directly with the code, using a terminal or other tools like the Jupyter Notebook, which we'll look at shortly. Machine learning and data analysis are fundamentally iterative processes, in which the data drives the analysis. It is essential for these processes to have tools that allow quick iteration

and easy interaction. As a general-purpose programming language, Python also allows for the creation of complex graphical user interfaces (GUIs) and web services, and for integration into existing systems.

Strengths and Weaknesses of Python

Every programming language has some strengths as well as weaknesses, so does Python too.

Strengths

According to studies and surveys, Python is the fifth most important language as well as the most popular language for machine learning and data science. It is because of the following strengths that Python has:

Easy to learn and understand: The syntax of Python is simpler; hence it is relatively easy, even for beginners also, to learn and understand the language.

Multi-purpose language: Python is a multi-purpose programming language because it supports structured programming, object-oriented programming as well as functional programming.

Huge number of modules: Python has huge number of modules for covering every aspect of programming. These modules are easily available for use hence making Python an extensible language.

Support of open source community: As being open source programming language, Python is supported by a very large developer community. Due to this, the bugs are easily fixed by the Python community. This characteristic makes Python very robust and adaptive.

Scalability: Python is a scalable programming language because it provides an improved structure for supporting large programs than shell-scripts.

Weakness

Although Python is a popular and powerful programming language, it has its own weakness of slow execution speed.

The execution speed of Python is slow as compared to compiled languages because Python is an interpreted language. This can be the major area of improvement for Python community.

Installing Python

For working in Python, we must first have to install it. You can perform the installation of Python in any of the following two ways:

- Installing Python individually
- Using Pre-packaged Python distribution: Anaconda

Let us discuss these each in detail.

Installing Python Individually

If you want to install Python on your computer, then then you need to download only the binary code applicable for your platform. Python distribution is available for Windows, Linux and Mac platforms.

The following is a quick overview of installing Python on the above-mentioned platforms:

On Unix and Linux platform

With the help of following steps, we can install Python on Unix and Linux platform:

- First, go to <https://www.python.org/downloads/>.
- Next, click on the link to download zipped source code available for Unix/Linux.
- Now, Download and extract files.
- Next, we can edit the Modules/Setup file if we want to customize some options.
 1. Next, write the command run `./configure` script
 2. make
 3. make install

On Windows platform

With the help of following steps, we can install Python on Windows platform:

- First, go to <https://www.python.org/downloads/>.
- Next, click on the link for Windows installer python-XYZ.msi file. Here XYZ is the version we wish to install.
- Now, we must run the file that is downloaded. It will take us to the Python install wizard, which is easy to use. Now, accept the default settings and wait until the install is finished.

On Macintosh platform

For Mac OS X, Homebrew, a great and easy to use package installer is recommended to install Python 3. In case if you don't have Homebrew, you can install it with the help of following command:

```
$ ruby -e "$(curl -fsSL  
https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

It can be updated with the command below:

```
$ brew update
```

Now, to install Python3 on your system, we need to run the following command:

```
$ brew install python3
```