CH 1: Python Overview

Python is a general-purpose interpreted, interactive, object-oriented and high-level programming language. It is easy to learn and having high level data structure support with efferent Object orientation. Easy syntax and dynamic typing make it an ideal language of scripting, which can be used rapid development of automated system. It’s clear syntax, new style of object oriented support, powerful data structure help to design and implement compact and easy code-base for a large system.

**1.1 Python Feature**

Basic feature provided by python is stated as below:

1. Interpreted: Python is a scripting language which process code at runtime by python interpreter. It is similar to PERL or PHP
2. Easy to learn: Python has relatively few keyword, simple data structure and clear & easy syntax.
3. Easy to read: Python code is highly compact and use indentation rather than using opening and closing brackets.
4. Easy to maintain: Python source code is easy to maintain, as they are highly compact.
5. Interactive mode: It allows write python statement in terminal and printing the result instantly.
6. Portable: Same python program can run in different platform like Windows, Linux, Mac.
7. OOPs: Python support object oriented concept like creating class, objects, inheritance.
8. Extendable: It’s easy to add low level module (like C/C++ code) to perform critical operation at maximum speed.
9. Multi-threading: Python support multi-threading.
10. A broad standard library support: python has a large number of library supports which allow us to create application in multiple domains easily. There module support OS operation, GUI, audio, video, data and image process, mobile application etc.

**1.2 Python Drawbacks**

Still, python has lot of advantage; it also comes with some drawbacks:

1. Software performance and Memory overhead: Python is little bit slower than C/C++ or Java and It also have high memory overhead compare to other languages(though benchmarks repeatedly demonstrate Python is comparable to Java in most applications)
2. Lack of true multiprocessor support: Still python have a good multi-threading support , it has very little multi-processor support.
3. Absence of a commercial support point: Python is Open Source and it is in glomming phase and take time to get the commercial support, even for an Open Source project (though this situation is changing)
4. Smaller pool of Python developers compared to other languages, such as Java.
5. Lack of prepackaged solutions: Python offers relatively few packaged solutions. It does include an extensive class library with the language’s distribution, and there are more and more programmers working on developing a PHP-equivalent tool.
6. Database access layer limitations: Compared to established technologies such as ODBC and JDBC, Python's database access layer seems a bit primitive and underdeveloped.
7. Documentation gaps: More than its rival languages Perl, Java, and to some extent PHP, Python suffers from a lack of extensive, accessible documentation and published books.
8. Absence of GUI and teamwork tools: Creating graphical user interfaces on Python applications is little-bit complex. Tk ships with the Python distribution and is the tool most often used by Python developers. But there is no accessible, easy-to-use GUI tool for Tkinter.

**1.3 How Python Code is differing from the other Codes?**

Python enable programmer to write code more compactly and readably. Python program much shorter then equivalent C /C++ or java code. The coding style of python includes:

1. No variable or argument declaration required
2. Allow to express Complex operation in a single statement.
3. Use indentation instead of beginning and ending brackets.
4. No data type specification required.

**1.4 History of Python:**

1. Python was conceived in the late 1980s
2. Python’s implementation was started in December 1989 byGuido van Rossum at CWI in the Netherlands
3. Python was first created by Guido von Rossum in 1990 and was named after the Brit-com Monty Python's Flying Circus.
4. In **February** 1991, Van **Rossum** published the code (labeled version 0.9.0) to alt.sources
5. Python reached version 1.0 in January 1994. The major new features included in this release were the functional programming tools lambda, map, filter and reduce.
6. It has since been developed by a large team of volunteers and is freely available from the Python Software Foundation.
7. The most recent version of Python, 2.5, was released in September, 2006.
8. Python is written in C. Still it is available in different flavors:
   1. A Java-based version of Python exists in Jython and may be used to work with Java code natively.
   2. Iron Python, a C# version, exists for the .Net and Mono platforms and allows C# programmers access to Python's power and flexibility.
   3. There is also a Python implementation written in Python itself.
9. The project PyPy was founded in 2003 in order to enable Python programmers to change the behavior of the Python interpreter at will. While it is an open source project, being developed openly by a community of developers for free distribution and modification.

**1.5 Who Uses python?**

Most of the top software organization, like Google, Amazon, Yahoo, Citrix, uses python for their development. The following product is developed using python.

1. Yahoo Maps
2. Yahoo Groups
3. Google Spider and Search Engine
4. Zope Corporation Server
5. OpenStack by Rackspace and NASA
6. Ultraseek Server, a commercial search engine product,
7. Linux Weekly News
8. Elastic Hosts web control panel is a Web application Python using the Django framework.
9. Shopping site like Shopzilla
10. Computer Games like Battlefield 2, The Crystal Space 3D etc.
11. Science and research : National Weather Service, Los Alamos National Laboratory (LANL) Theoretical Physics Division, Johnson Space Center, NASA,

You can get full list <https://wiki.python.org/moin/OrganizationsUsingPython>