

Assignment 2

1. What is Python?

Python is an interpreted, high-level, general-purpose programming language. It was created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Python is dynamically typed. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library.

Most commonly used version of Python is 2.7.11 (5-Dec-2015)

Python is relatively simple, so it's easy to learn since it requires a unique syntax that focuses on readability. Developers can read and translate Python code much easier than other languages. In turn, this reduces the cost of program maintenance and development because it allows teams to work collaboratively without significant language and experience barriers. Additionally, Python supports the use of modules and packages, which means that programs can be designed in a modular style and code can be reused across a variety of projects. Once you've developed a module or package you need, it can be scaled for use in other projects, and it's easy to import or export these modules.

2. Features of Python?

Python is:

1. Simple – Python is a simple and minimalistic language. Reading a good Python program feels almost like reading English, although very strict English! This pseudo-code nature of Python is one of its greatest strengths. It allows you to concentrate on the solution to the problem rather than the language itself.
2. Easy to Learn - As you will see, Python is extremely easy to get started with. Python has an extraordinarily simple syntax.
3. Free and Open Source - Python is an example of a FLOSS (Free/Libre/Software and Open Source Software). In simple terms, you can freely distribute copies of this software, read its source code, make changes to it, use pieces of it in new free programs, and that you know you can do these things. FLOSS is based on the concept of a community which shares knowledge. This is one of the reasons why Python is so good - it has been created and is constantly improved by a community who just want to see a better Python.
4. High level language – Python enables a programmer to write programs that are more or less independent of a particular type of computer. Such languages are considered high-level because they are closer to human languages and further from machine languages.
5. Portable - Due to its open-source nature, Python has been ported (i.e. changed to make it work on) to many platforms. All your Python programs can work on any of these platforms without requiring any changes at all if you are careful enough to avoid any system-dependent features.
6. Interpreted -

7. An interpreted language – Python is a type of programming language for which most of its implementations execute instructions directly and freely, without previously compiling a program into machine-language instructions.
8. Extensive Libraries - The Python Standard Library is huge indeed. It can help you do various things involving regular expressions, documentation generation, unit testing, threading, databases, web browsers, CGI, ftp, email, XML, XML-RPC, HTML, WAV files, cryptography, GUI (graphical user interfaces), Tk, and other system-dependent stuff. Remember, all this is always available wherever Python is installed. This is called the 'Batteries Included' philosophy of Python.

3. Who are using Python?

Instagram,
Google,
Spotify,
Netflix,
Uber,
Dropbox,
Pinterest,
Instacart

4. Where we can use Python?

Python can be used for things like:

Back end (or server-side) web development and mobile app development

Desktop app and software development

Artificial Intelligence – Robotics

Data Science - Processing big data and performing mathematical computations

Writing system scripts (creating instructions that tell a computer system to “do” something)

5. Netflix - Python use case

Ranging from Administrative domains to Reliability and Data Science to Machine Learning etc, Netflix uses Python for nearly every edge of their business.

Open Connect:

Content Delivery Network that Netflix makes use of is, Open Connect. Open connect basically come into when you click on the ‘play’ button. All the content delivered to the end user is looked after by this CDN. Open connect requires various other software systems to design, build and operate it which are in turn written in Python. Not just this, the network devices underlying this CDN are Python applications since Python is prominent in solving network issues.

Demand Engineering Team:

The Demand Engineering team is responsible for handling the Netflix cloud’s Regional Failovers, Traffic Administration, Capacity Operations Management (looking after the limit up to which the content can be made serviceable), and Fleet Efficiency. The elements of Python used by this team are:

- NumPy and SciPy
- Boto3

- RQ (Redis Queue)
- Flask
- Jupyter Notebook

Machine Learning Infrastructure:

Machine Learning ranges from creating Personalization algorithms to figuring out the use cases. Personalization algorithms help to train the Machine Learning models as per the Netflix standards. It provides personalized recommendations, outlines on a day-to-day basis, label generations, etc.

The libraries required to learn Deep Neural Networks are **TensorFlow**, **Keras**, and **Pytorch** whereas **XGBoost** and **LightGBM** for Gradient Boosted Decision Trees. They have also developed quite a few higher-level libraries that help in combining with the work areas such as fact logging, feature extraction, publishing, etc. Apart from all this, Netflix also uses **MetaFlow** to create machine learning projects.