Curriculum (Python Course)

Python Programming (General Course):

Please install Python 3.6.7 and any editor of your choice (recommended pycharm or atom or sublime). Preferred to work with unix/mac/Linux as it is comparatively easy to manage virtual environment here. If using windows then set the path of python application and pip application in environment variable, otherwise I will help.

Topics and expected hours

1. Intro to Python – ‘Hello world’ program. Python is Script or interpreted or general purpose programming language. Python is procedural, functional or object oriented programming language.

Python interactive interpreter and all other methods to interpret the code. Compilation in Python apart from interpretation. Difference between 2.x and 3.x version of python. Pip console Virtual environment concept to use any version of python in your python terminal.

Python language feature. Python vs Java and R. Advance concept in Python isolated from all other languages. High optimization in python. How python fits better than any other language for Machine Learning/Statistical Modelling/Artificial intelligence. Intro to web/rest API using Python. Intro to Python framework – e.g. Flask, Django etc. Example of some NoSQL database which uses python as a language either natively or through REST API. Interesting connectivity with python with some other platform like couch base, SQLite, couchdb, postgreSQL etc. Intro to debug the python code, creating Logs and unit test cases. Creating a library in python. Build using Docker and Jenkin.

Improvement of performance of python program using CPython, Cython, Jython, IronPython etc.

Reserved keywords in Python

- 3 hours

1. Variable, scope of variables, Expression, Data types, memory utilization according to data type, maximum value accepted by a particular data type. Operator in python. Inplace vs standard operator. Operator function in python, chaining comparator, Module concept. Method vs Function. Inbuilt method and inbuilt function. Life cycle of variable, method and function. Precise object concept in python. Type conversion. End parameter.

* 3 hours

1. Name, namespace, \_\_ concept, \_ concept, private/protected variable concept. Control flow, conditional statement, how ternary operator works in python, looping, implicit iterable & iterator, implicit methods for how to iterate any iterable, explicit iterator and there call using user defined function

* 3h

1. Command line input, input from user, User defined function, pass statement, callable, list, list comprehension, list methods, tuple, tuple methods, set, set methods, dictionary, dictionary methods, range and range methods, string and strings methods, mutable and un-mutable target. Type conversion among them. packing and unpacking. String formatting.

* 3h

1. Method chaining, comparing sequences, default argument, keyword argument, arbitrary arguments, positional vs keyword arguments. Lambda expression, Stack and Queue data structure. Module and packages, Matrix manipulations.

* 3h

1. Data Model - \_\_doc\_\_ func\_doc, [\_\_name\_\_](https://docs.python.org/2/library/stdtypes.html#definition.__name__) func\_name, \_\_module\_\_, \_\_defaults\_\_ func\_defaults, \_\_code\_\_ func\_code, \_\_globals\_\_ func\_globals, [\_\_dict\_\_](https://docs.python.org/2/library/stdtypes.html#object.__dict__) func\_dict, \_\_path\_\_ difference between directory and package & library, sys library, numpy, panda, user defined package, operator library, math and cmath, numeric function, complex number and their operation, trigonometric and hyperbolic function, logarithmic and power function, special function and constants like gamma, pi etc. calendar and datetime module, intra package references. Packages in multiple directories

* 3h

1. Input output formatting, Reading & writings of files and associated function, data structure in JSON, map, reduce, filter, random numbers, Errors and exceptions, user defined exceptions, built in exceptions, exception calling concept. Context Manager.

* 3h

1. OOP concept in Python, object, instances and reference variable, constructor and their call, self and \_\_init\_\_ concept, unbound and bound functions, class bound, static bound methods.

-3h

1. Closure, Decorator, Generator, Generator expression, Counter, optimization, getter and setter, property

* 3h

1. Inheritance – multilevel and multiple inheritance, abstract method and abstract class in python, interface concept in Python, concept analogous to this in python, parent class constructor and method calling, operator overloading, overriding.

* 3h

1. Memory Management in Python, Garbage collection and corresponding algorithm, life cycle of objects.

* 3h

1. More on collection, Multithreading, Multitasking, statistical function, Decimal functions.

* 6h

1. Database connectivity and data processing from database,OS module, Python GUI, Cluster/Network creation, some standard program

* 3h

Python Development (Next Course):

1. Flask Framework (10h)
2. Writing Web API (2h)
3. Creating Batch Processing Job (1h)
4. Writing Advance Logs (2h)
5. Writing Unit test cases (2h)
6. Managing project in layers (1h)

Data Engineering/Data Science (Next Course):

1. Numpy

* 3h

1. Pandas

* 3h

1. Data cleansing and data extraction for data analytics, Data exploration and dashboard creation

* 3h

1. Python in Machine learning with data science concept

* 3h

1. Python for segmentation

* 10h

1. Python for prediction (Linear regression)

* 8h

1. Python for classification

* 10h

1. Python for Forecasting

* 8h

1. Python for sentiment analysis

* 8h