Prerequisites

There are no such prerequisites to learn Python but having a basic knowledge of any programming language concepts like **what is a loop, what if and else does, how operators are used, etc.** will be helpful. **We recommend Basics of C/C++** will **help you** to understand the python and ultimately it will decrease the learning time span of python.

Python for beginner programmers.

Chapter 1. Introduction of Python
• Why Python
• Benefits / features of python
• Role of PVM
• Job openings of python
• Installation of Python Interpreter
• Introduction of IDE – PyCharm
• Download and Installation of PyCharm
Chapter2. Python Work flow
• How to create script
• How to deal with data printing & scanning in Python.
• Package creation
Chapter3. Loops in Python
• For | while | - variation of range()
• Use of Continue ,Pass, Break
Chapter4. Decision Making | Data Validation
• If | if else | if..elif..else
• Conditional Operators | Logical operators in Python
Chapter5. DataTypes in Python : with Builtin Functions
• List
• Tuple
• Set
• Dictionary
• Array
• String
Chapter6. Modular Programming in Python
• Class | Object
• Data migration from One Package to another package
• Functions
• Constructor | destructor
• Main function is Python

Chapter7. Powerful Lambda function
• Filter | Map | Reduce
Chapter8. File Operations
• File Handling with read/ write Operations using read() | readline() | readlines() |write()| writelines()
• Event Logs
• File handling with Log files
Chapter9. Regular Expression
• Introduction
• Rules of regular expression
• Pattern searching | Mapping | validation of Data
Chapter10. Exception Handling
• Programming using exception handling technique
• Exception handling with file operations
Chapter11. Database Interaction
• Introduction of database
• Installation of Database
• Basic SQL commands of Database
• Integration of Python and Database using connector
• Python interface with Database using select | Insert | Update | Delete | Join | Drop | create commands

Module2: Machine learning for beginner programmers.

Pre-requisites:

- Linear Algebra
- Statistics and Probability
- Calculus
- Graph theory
- Programming Skills – Language such as Python, R, MATLAB.

Data Science Libraries use in algorithm implementation which you will get **overview of these libraries** as mentioned below

- Numpy
- Pandas
- Matplotlib
- Seaborn
- Sklearn
- Tensorflow
- Pytorch

Chapter1. Introduction to Machine Learning
• Introduction of Data in machine learning
• Application
• How to understand algorithms.
• Terminologies of Machine learning
• Difference between Machine learning & Artificial Intelligence.
• Introduction Anaconda Navigator | jupyter notebook
• Installation of Anaconda Navigator
Chapter2. Classification of Machine Learning
• Supervised | Unsupervised | Reinforcement | Semi Supervised
Chapter3. Parametric Methods
3.1 Classification Based – KNN algorithm implementation.
3.2 Regression Based algorithm Implementation
• Linear Regression • Multivariate Linear regression • Logistic regression
3.3 Introduction of Pytorch
• Installation of Pytorch
• Linear regression using Pytorch
• Difference between Pytorch & Tensorflow
3.4 Introduction of Tensorflow
Installation of tensorflow

- Linear regression using Tensorflow
- Softmax regression using Tensorflow (Handwritten Digit Identification)

3.5 Confusion matrix in Machine Learning

Chapter4. Dimensionality Reduction

- Parameters for feature selection
- Overfitting & Under fitting in Machine Learning

Chapter5. Clustering

- Clustering in Machine learning
- Types of clustering algorithm
- Implementation of K- means | Gaussian Mixture Model

Chapter6. Non – Parametric Methods

- Introduction of Decision Tree
- Decision Tree Implementation
- K nearest Neighbor algorithm

Chapter7. Introduction of ANN (Artificial Neutral Network)

- Introduction of Binomial neutral network VS ANN

Chapter8. Hidden Markov Model

- Overview of Hidden Markov process
- Introduction Chinese Room Argument

Chapter9. Data Pre-Processing

- Understanding data processing
- Data cleaning | Data cleansing

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