

## Python Overview

- What is Python?
- The Birth of Python
- Python Timeline
- Features of Python
- Versions of Python

## The Python Environment

- Installation of Python
- Python Documentation
- Getting Help
- Python Editors and IDEs
- Basic Syntax
- Running a Python Script
- Python Scripts on UNIX/Windows

## Getting Started

- Keywords
- Data Types
- Variables
- Naming Conventions
- Print(),Type(),Id() Functions
- Input(), Raw\_input() functions
- Conversion functions
- Del Keyword

## String Handling

- What is String?
- Single-quoted string literals
- Tripe-quoted string literals
- String Indexing
- String Slicing
- Working with String Functions
- Working with String Methods

## Operators

- Arithmetic Operators
- Relational Operators
- Logical Operators
- Assignment Operators
- Short Hand Assignment Operators
- Bitwise Operators

**Flat No: 506,5<sup>th</sup> Floor, Nilgiri Block, Aditya Enclave, Ameerpet, Hyd -500038.**

**Contact: +91 9032734343, 9989844844. Mail: [info@vritsol.com](mailto:info@vritsol.com) [www.vritsol.com](http://www.vritsol.com)**

- Membership Operators
- Identity Operators

## Flow Control

- About Flow Control
- Conditional Statements (Simple if, if...else, if...elif...)
- Looping Statements ( while loop, while ... else, for loop, infinite loop, nested loops)
- Break
- Continue
- Pass

## Sequences

- About Sequences
- Lists
- Multi-Dimensional Arrays
- Tuples
- Indexing and Slicing
- Iterating through a sequence
- Functions for all sequences
- Operators and keywords for sequences
- The xrange() function
- Nest sequences
- List comprehensions
- Generator expressions
- Yield vs return
- Iterators and Generators

## Dictionaries and Sets

- About Dictionaries
- When to use dictionaries
- Creating Dictionaries
- Getting dictionary values
- Iterating through a dictionary
- Reading file data into a dictionary
- Counting with dictionaries
- About sets
- Creating sets
- Working with sets

## Functions

- Defining a function
- Calling a function
- Function Parameters
- Returning Values
- Variables scope
- Call by value
- Call by reference
- Passing collections to a function
- Passing functions to function
- Lamda function

## Modules

- What is a module?
- Creating user defined module
- Setting path
- The import statement
- Module search path
- From ... Import
- Module Aliases
- Dir function
- Working with Standard modules ( Math, Random, Date and time, Os and sys, String,...)

## Packages

- Introduction to Packages
- Executing Modules as Scripts
- Packages in Multiple Directories
- Fancier Output Formatting
- Compiled Python Files
- Types of Compiled Python Files
- Compatibility of Compiled Python Files

## Errors and Exception Handling

- Syntax Errors
- What is Exception?
- Need of Exception handling
- Predefined Exceptions
- Predefined Exceptions Hierarchy
- Except, try, finally clause
- Handling Multiple Exceptions
- User defined Exceptions
- Raise, assert statements

## File Handling

- Opening a file
- Closing a file
- Writing data to files
- Reading a data from files
- Tell(),Seek() functions
- Working with Directories

## Pandas

- Introduction to pandas
- Numpy arrays
- Series and dataframes
- ndarrays
- Matplotlib
- Data Visualization
- Advanced concepts in pandas and numpy arrays

## Machine Learning

- Introduction
- ML Life Cycle
- Supervised vs Unsupervised vs Reinforcement
- Optimization
- Regularization
- Hyperparameters
- Validation
- Data
  - Introduction
  - Feature Selection
  - Feature Engineering
  - Principal Component Analysis (PCA)
  - Missing and Unbalanced Data
  - Label and Encoding
  - Splitting and Randomization
  - RecordIO Format
- Machine Learning Algorithms
  - Introduction
  - Logistical Regression
  - Linear Regression
  - Support Vector Machines
  - Decision Trees
  - Random Forests
  - K-Means
  - K-Nearest Neighbour
  - Latent Dirichlet Allocation (LDA) Algorithm
- Deep Learning Algorithms

- Introduction
- Neural Networks
- Convolutional Neural Networks (CNN)
- Recurrent Neural Networks (RNN)
- Model Performance and Optimization
  - Introduction
  - Confusion Matrix
  - Sensitivity and Specificity
  - Accuracy and Precision
  - ROC/AUC
  - Gini Impurity
  - F1 Score
- ML Frameworks
  - Introduction
  - TensorFlow
  - PyTorch
  - MXNet
  - Scikit-Learn
- AWS - Services - Cornered specific to AI
  - S3
  - Glue
  - Athena
  - QuickSight
  - Kinesis, Streams, Firehose
  - EMR with Spark
  - EC2 for ML
  - Amazon ML
- AWS Services built for/ on ML
  - Introduction
  - AWS Rekognition
  - Polly
  - Transcribe
  - Translate
  - Comprehend
  - Lex
  - Service Chaining with Step functions
  - DeepLens
  - DeepRacer
- AWS Sagemaker
  - Introduction
  - Using existing modules/ Models
  - Installing/ Integrating third party frameworks/ Modules
  - Sagemaker Notebooks
- Build
  - Data Preprocessing
  - Ground Truth
  - Preprocessing Image
  - Algorithms - Introduction

# Python With ML

- Train
  - Sagemaker Algorithms - Architecture
  - Training an Image Classifier
  - Hyperparameter - Tuning
- Deploy
  - Inference - Introduction
  - Inference Pipelines
  - Real time and Batch Inference
  - Deploy and Image Classifier (Pinehead, NotPinehead)
  - Accessing Inference from Apps
  - Create Customing API for Inference
- Security
  - Securing SageMaker Notebooks
  - SageMaker and VPC

