



## **Machine Learning with Python**

### **Duration 4 Weeks**

Over the past decade, machine learning has developed into a well-defined discipline with clear goals that revolve around improving performance with experience. The field has strong experimental, theoretical, and applied arms, each with its own criteria for success. Most important, machine learning has substantially broadened its vision to incorporate a wide range of methods, some having their origins in AI but others coming from pattern recognition and statistics. A central goal of artificial intelligence has long been to construct a complete intelligent agent that can perceive its environment, generate plans, execute those plans, and communicate with other agents. An intelligent agent must do more than perceive its surroundings and plan its actions; it must also execute those actions in the world.

Software: Anaconda Navigator Latest (IDE) version

- Web-based interactive computing note book environment – **Jupyter Notebook** 6.4.5 or higher
- Scientific Python Development Environment **Spyder** 5.0.5 or higher

### **1<sup>st</sup> Week**

#### **Python Environment Concepts**

1. Jupyter Note Book – Spyder Overview
2. JYNB Working Environment
3. Structure of jpynb
4. Saving/Loading Notebook
5. Edit Cells /View Cells /Insert Cells
6. Keyboard Shortcuts /Magic Commands
7. Execute Cells /Kernel Cells /Widgets / Markdown



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**Core Python Programming**

8. Elementary Programming with simple examples
9. Mathematical Functions, Strings, and Objects
10. Loops with programming
11. Functions & Class functions generation
12. Import functions & generate user define import functions

**2<sup>nd</sup> Week**

**Advanced Python Programming**

13. Data structures [List, Tuple, Set, Frozen set, and Dictionary]
14. Build in Functions & Lambda Functions
15. Packages, Modules
16. Math, OS, Random, Statistics, Sys, other Modules
17. Create UDM (User Defined Modules)

**Data Analysis with Packages & explain cheat sheets**

18. Numpy
19. Scipy
20. Pandas
21. Seaborn
22. Bokeh



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### **3<sup>rd</sup> Week**

#### **Overview of Machine learning**

23. Introduction to types of Machine Learning
24. Introductions to Supervised Learning
25. Introductions to Unsupervised Learning
26. Introduction to Reinforcement learning
27. Introduction to ML with Pipelines – Automatic Workflows
28. Introductions to Improving Performance of ML Models
29. Performance Improvements with Algorithm Tuning\_1
30. Performance Improvements with Algorithm Tuning\_2

#### **Types of Data Analysis**

31. Descriptive Analyses
32. Exploratory Data Analysis
33. Predictive Analysis
34. Inferential Analysis

#### **Data Visualization with Matplotlib**

35. Working with Pyplot
36. Lines, Bar, Pie, Scatter, Histogram, Box, Violin Plots

### **4<sup>th</sup> Week**

#### **Algorithms Implementation**

37. Algorithm\_1 Linear regressions.
38. Algorithm\_2 logistic regressions.
39. Algorithm\_3 Decision tree.
40. Algorithm\_4 Support Vector Machine (SVM)
41. Algorithm\_5 Naive Bayes

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42 . Algorithm\_6 KNN algorithm.

43. Algorithm\_7 K-means

44 . Algorithm\_8 Random forest algorithm.

### **Industry Based Project**

45. My first project in ML

46. Case study Industry Project and Implementation with analysis

47 . project Viva Sessions

