TRENDS° Academy
Learning | Evolving | Empowering

# MACHINE LEARNING WITH PYTHON

**Duration:  5 Days**

**Course Outlines:**

**MODULE 1 :- Introduction to Machine Learning**

- Basics of Machine Learning
- What and why Machine Learning
- Applications of Machine Learning
- Types of Machine Learning
- Main Challenges of Machine Learning

**MODULE 2 :- Scikit Learn**

- Introduction to Scikit Learn
- Features of Scikit-Learn
- CONVENTIONS
- IMPLEMENTATION STEPS

**DEMO 1 - Scikit- Learn Introduction and model training**

**MODULE 3 :- Linear Algebra**

- Vectors (2D,3D)
- Dot Product
- Hyperplane
- Square, Rectangle
- Hypercube

**DEMO 2 - Linear Algebra Concept2**

**MODULE 3 :- Probability**

- Data types and its measures
- Random Variables,its application with variables
- Probability-Application with examples
- Probability distribution with examples
- Sampling Funnel-why And how

**DEMO 3 - Probability Concepts**

**MODULE 4 :- Statistics**

- WHAT IS STATISTICS
- BASIC TERMINOLOGIES IN STATISTICS
- TYPES OF STATISTICS
- DESCRIPTIVE STATISTICS
- MEASURE OF CENTRAL TENDENCY ( Mean, median, mode )
- Measures of dispersion ( Variance,Standard Deviation,Range-its derivation )
- Measures of Skewness & kurtosis
- INFERENTIAL STATISTICS

**DEMO 4 - Descriptive_Statistics**

**DEMO 5 - Statistics methods**

**DEMO 6 – Correlation**

**DEMO 7 - Distribution function**

**MODULE 5 :- Data pre-processing**

- Is your data clean?
- What is Data Pre processing ?
- Data cleaning techniques

**DEMO 8 - Missing value imputation by Mean, Median**

- Handling Missing data
- Handling Categorical data

**DEMO 9 - Handling Categorical Value**

**MODULE 6 :- Exploratory Data Analysis (EDA)**

- Introduction
- 2D Scatter-plot
- 3D Scatter-plot
- Pair plots
- Univariate, Bivariate and Multivariate
- Histogram
- Box-plot
- Variance, Standard Deviation
- Median
- IQR ( InterQuartile Range)

**DEMO 10 - EDA using Iris dataset**

**MODULE 7 :- Feature Engineering**

- Introduction
- Need for Feature Engineering in Machine Learning
- Steps in Feature Engineering
- Feature Engineering Techniques

**DEMO 11 - Feature Transformation and Encoding**

**MODULE 8 :- Performance Metrics & Parameter Tuning**

- Confusion Matrix
- ROC Curve
- Cross Validation in Machine Learning
- K fold Cross Validation & Grid search

**ML - SUPERVISED LEARNING**

**MODULE 9 :- Supervised Learning - Regression I**

- Linear Regression - Mathematical Intuition
- Programming of Linear Regression in Python-scikit learn

**DEMO 12 - Simple Linear Regression**

- Multiple Linear Regression
- Multiple Linear Regression - Mathematical Intuition

**DEMO 13 - Multi Linear Regression**

- Polynomial Regression

**DEMO 14 - Polynomial Regression**

- Support Vector Machines
- Implementation of SVM In Python
- Various Kernels in Support Vector Machines

**DEMO 15 - Implement SVM**

**MODULE 10 :- Supervised Learning – Classification**

- Difference between regression and classification
- Various Algorithms in Classification
- Logistic Regression

**DEMO 16 - Logistic Regression**

- Naive Bayes

**DEMO 17 - Naive Bayes**

- Ensemble Techniques
- Introduction to Decision Trees
- Introduction to Random Forest
- Bagging
- Boosting
- Developing a Random Forest Model in Python

**DEMO 18 - Ensemble Techniques**

- Mini Project

**DML - UNSUPERVISED LEARNING**

**MODULE 11 :- UnSupervised Learning - Clustering**

- Unsupervised Learning
- Types of Unsupervised Learning
- Applications of Unsupervised Learning
- Introduction to Clustering Algorithms
- Types of Clustering Algorithms
- What is K-Means Clustering?
- Implementation of K-Means Clustering
- Improving Models

**DEMO 19 - K-mean Implementation**

**MODULE 12 :- UnSupervised Learning - Association Rule Mining**

- What is Association Rule Mining?
- Algorithms in Association Rule Mining
- Implementation of Apriori in Python

**DEMO 20 - Implementation of Apriori**

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