

# **MACHINE LEARNING PYTHON STATISTICS**

**One-on-One Classes  
Customized for every Student**

**15+ Projects  
Portfolio development  
(Resume, GitHub & LinkedIn)**



# Python - Beginner



## Python Basic

- Introduction
- Installation
- Python objects, number & Booleans, strings.
- Container objects, the mutability of objects
- Operators
- precedence, and associativity
- Conditions (if-else, if-elif-else), loops (while, for-else)
- Break and continue statement and range function



## String Objects

- basic data structure in python
- String object basics
- String inbuilt methods
- Splitting and joining strings
- String format function

## Tuples, Set, Dictionaries

- Tuples
- Set
- Dictionary object methods
- Dictionary comprehensions
- Dictionary view objects

## List Object Basics

- List methods
- List as stack and queues
- List comprehension
- Map. Reduce and Filter

## Functions

- Functions basics, parameter passing, iterators.
- Lambda functions
- Map, reduce, filter functions
- Generator functions
- Decorator

# Python - Intermediate

## Oops Concepts

- oops basic concepts.
- Creating classes
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction

## File Handling

- Open
- Read/ReadLine
- Write
- Append
- Seek

## Exception-Logging

- Exceptions handling with try-except
- Custom exception handling
- List of general use exception
- Best practice exception handling
- Logging
- **Project: Custom Logger**

## Database with Python

- SQLite
- MySQL
- Mongo dB
- NoSQL - Cassandra
- **Project: Database with Oops**

## Flask web App

- Flask application
- Open link flask
- App routing flask
- Url building flask
- Templates flask
- Flask project
- Postman
- Request Library
- **Project: DB APIs**



# Python - Advanced

## Pandas Basic

- Python pandas - series
- Python pandas – data frame
- Python pandas – panel
- Python pandas - basic functionality
- Reading data from the different file system

## Pandas Advance

- re-indexing python
- iteration
- sorting.
- Working with text data options & customization
- Indexing & selecting
- Data statistical functions
- window functions
- date functionality
- time delta
- categorical data
- visualization

## Numpy

- ND array object.
- data types.
- array attributes.
- array creation routines.
- array from existing.
- Data array from numerical ranges.
- indexing & slicing.
- Numpy – advanced indexing.
- Numpy – broadcasting.
- iterating over an array.
- array manipulation.
- binary operators.
- string functions.
- mathematical functions.
- arithmetic operations.
- statistical functions.
- Sort, search & counting functions.
- byte swapping.
- copies & views.
- matrix library.
- linear algebra

## Visualization Packages

- Matplotlib
- Seaborn
- Plotly

# Statistics

## Basic

- Introduction to basic Statistics terms.
- Types of Statistics.
- Types of data.
- Levels of measurement.
- Measures of Central Tendency.
- Measure of dispersion.
- Random Variables.
- Set.
- Skewness.
- Covariance and Correlation.

## Probability Distribution Function

- Probability density/distribution function.
- Types of the probability distribution.
- Binomial Distribution.
- Poisson distribution.
- Normal Distribution (Gaussian Distribution).
- Probability Density
- Cumulative Density Function.
- Bernoulli Distribution.
- Uniform Distribution.
- Z Stats.
- Central Limit Theorem.

# Advance Statistics

- Hypothesis.
- Hypothesis Testing's Mechanism.
- P-Value.
- T-Stats.
- T-Stats vs. Z-Stats: Overview.
- When to use a t-tests vs. z-tests.
- Type 1 & Type 2 Error.
- Bayes Statistics (Bayes Theorem).
- Confidence Interval(CI).
- Confidence Intervals and the Margin of Error.
- Interpreting confidence levels and confidence intervals
- Chi-Square Test.
- Chi-Square Distribution using Python.
- Chi-Square for Goodness of Fit Test.
- When to use which statistical distribution?.
- Analysis Of Variance (ANOVA).
- Assumptions to use ANOVA.
- Anova three types.
- Partitioning of Variance in the ANOVA.
- Calculating using Python.
- F-Distribution.
- F-Test (variance ratio test).
- Determining the Values of F.
- F Distribution using Python

# Feature Engineering

- Handling Missing Data.
- Handling imbalance, data up-sampling.
- Down-Sampling.
- Data interpolation.
- Handling Outliers.
- Filter Method.
- Wrapper method.
- Embedded Methods
- Feature Scaling
- Standardization
- Mean Normalization.
- Min-Max Scaling
- **Data Encoding** -Nominal Encoding, One hot encoding, One hot encoding with multiple categories, Mean Encoding, Ordinal Encoding, Label Encoding & Target guided ordinal encoding
- Covariance
- Correlation Check
- Pearson correlation coefficient
- Spearman's Rank correlation

# Feature Selection

# Machine Learning

## Regression

- Linear Regression.
- Gradient Descent.
- Multiple Linear Regression.
- Polynomial Regression.
- R square and Adjusted R square.
- RMSE , MSE, MAE comparision.
- Regularized Linear Models.
- Ridge Regression.
- Lasso Regression

## Logistics Regression

- Logistics Regression indepth intuition
- Indepth mathematical intuition.
- Indepth geometerical intuition.
- Hyper parameter tuning.
- Grid search CV.
- Randomize search CV.
- Confusion Matrix.
- Precision, recall, F1 score, ROC, AUC.
- Best metric selection.
- Multiclass classification in LR.

**With Code Implementation in Python**



# Machine Learning

## Decision Tree

- Decision Tree Classifier.
- Indepth mathematical intuition.
- Indepth geometrical intuition.
- Confusion Matrix.
- Precision, Recall, F1 score, ROC, AUC.
- Best metric selection.
- **Decision Tree Regressor.**
- Indepth mathematical intuition.
- Indepth geometrical intuition.
- Performance metrics

## Support Vector Machines

- **Linear SVM Classification**
- Indepth mathematical & geometrical intuition.
- Soft Margin Classification.
- Nonlinear SVM Classification.
- Polynomial Kernel.
- Gaussian, RBF Kernel.
- Confusion Matrix.
- Precision, recall, F1 score, ROC, AUC.
- Best metric selection.
- **SVM Regression.**
- Indepth mathematical & geometrical intuition

**With Code Implementation in Python**

# Machine Learning

## Naïve Bayes

- Bayes Theorem.
- Multinomial Naïve Bayes.
- Gaussian Naïve Bayes.
- Various Type of Bayes theorem and its intuition.
- Confusion Matrix.
- Precision, Recall, F1 score, ROC, AUC.
- Best metric selection

## KNN

- KNN Classifier.
- KNN Regressor.
- Variants of KNN.
- Brute Force KNN.
- K-Dimension Tree.
- Ball Tree.

- **Ensemble Techniques and its types**
- **Boosting**
- **Stacking Techniques**
- **Dimensionality Reduction**
- **Anomaly Detection**

**With Code Implementation in Python**

# Machine Learning

## Clustering

- Clustering and their types
- K-Means Clustering
- K-Means++
- Batch K-Means
- Hierarchical Clustering
- DBSCAN
- Evaluation of Clustering

## Time Series

- What is a time series?
- Old Techniques
- ARIMA
- ACF and PACF.
- Time-dependent seasonal components.
- Auto regressive (AR), moving average (MA) and mixed ARMA-modeller.

**With Code Implementation in Python**

# Projects

4 Database connection API

Sending Bulk emails

Web scrapping

Image Scraping

Data Pipeline

5+ EDA case study

Python Library - PyPi Package

## **End-to-End Machine Learning Project**

Fault detection in wafferes based on sensordata

Credit Card Fraud

Sales Demand Forecast

ChatBot Project

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