

Data Analysis and Predictive Modelling using Python

Description of Course :

This program is well suited for both beginners or experienced developers looking to make the jump to Data Analysis, Data Science or Machine Learning. In this course, you will learn

- how to work with data
- how to analyse data
- How to visualise the data using python packages.
- Implementing the predictive analysis concepts
- Implementing the predictive analysis

Duration:

7 Days (56 hours)

Part One:-

Highlight of Course :

- Basic Python
- Numpy, Pandas
- Matplotlib
- Seaborn
- Plotly and Cufflinks

Prerequisites:

Basic knowledge of Python.

MODULE 1 :- NumPy package

- Introduction of NumPy
- Install Numpy
- Array Creation
- Array Reshaping
- Indexing
- Operation
- Sorting and Stacking
- BroadCasting
- Linear Algebra
- Saving and Loading

MODULE 2 :- Pandas

- Introduction
- Slicing Dataframe
- Filtering Dataframe
- Transforming Dataframe
- Advanced indexing
- Stack and unstack
- Groupby and aggregations

MODULE 3 :- Matplotlib

INTRODUCTION

- Introduction to Matplotlib
- Exploring Data using Python
- Matplotlib with Jupyter
- Load data

ARCHITECTURE

- How to pyplot Works
- Troubleshooting issues

DIFFERENT PLOTS

- Line Chart
- Multi Line Plot
- Fill Plot
- Bar Chart
- Pie Chart
- Histogram
- Scatterplot

PLOTTING

- Themes
- Scatter
- Subplot
- 3d plot
- Grid
- Save Image
- Legend

CONFIGURE MATPLOTLIB

- Style Sheets
- Custom Style Sheets

INTERACTIVITY

- Handling Event
- Create An Interface With ipywidgets

MAPS

- Basemap
- Creating a Choropleth With Matplotlib

MODULE 4 :- Seaborn

INTRODUCTION

- Introduction to Seaborn

- Importing Dataset
- Seaborn Vs Matplotlib
- Using Seaborn with Matplotlib

LOAD DATA

- Loading a built-in Seaborn data
- Loading a Pandas Dataframe

PLOTS

- LinePlot
- Distplot
- BarGraph
- ScatterPlot
- JointPlot (KDE)
- StripPlot
- Box
- Point Plot
- FacetGrid
- Pair Grid
- CatPlot

Customising Seaborn Plots

- Changing Figure Aesthetic
- Removal of Spines
- Changing the figure Size
- Scaling the plots
- Setting the Style Temporarily

Creating Different Types of Plots

- Relational Plots
- Categorical Plots
- Distribution Plots
- Regression Plots

Colour Palette

- Diverging Colour Palette
- Sequential Colour Palette
- Setting the default Colour Palette

MODULE 5 :- Plotly

- Installation and Setup
- Line Plot
- Scatter Plot
- Bar Plot
- Box Plot and Area Plot
- 3D Plot
- Spread Plot and Hist Plot
- Bubble Plot and Heatmap

PART TWO:-

Module 6: Python for data analytics and pre processing

- Exploratory data analysis
- Data Cleaning, handling missing values, handling categorical data
- Hot encoding
- Data transformation
- Data normalization
- Train, Test Data

Module 7: Supervised machine Learning regression

- Concept of linear regression
- OLS, regression errors, data processing
- Multi regression, degree of freedom, adjusted R-squared.

- Concept of dummy variable

Module 8: Supervised machine learning classification

- Logistic regression, stratification, confusion matrix
- Support vector machine, mathematical intuition, different kernels
- Decision tree
- Random forest classification
- Ensemble learning
- Bagging and Boosting
- Evaluation metrics like accuracy, precision, recall, F1, AUC ROC curve

Module 9: Feature selection and Dimensionality Reduction

- Feature selection importance
- Concept of univariate feature selection
- F-test, chi square test
- Generic univariate select
- Recursive feature elimination
- Principal component analysis
- Need to reduce dimensions and importance
- Mathematical intuition

Module 10: Cross validation and hyperparameter tuning

- Importance of cross validation
- Parameter and implementation of cross validation
- Concept of hyper parameter tuning
- Grid search and randomized search

Module 11: Unsupervised Machine learning and NLP

- Introduction to clustering
- Mathematical intuition behind clustering
- K-means clustering
- Elbow method
- Introduction to NLP
- Concept of tokenization, stop words, stemming, lemmatization

- Tf-Idf vector and its mathematical intuition

Module 12: Deep Learning

- Need and application of deep learning
- Working of artificial neural network
- Backend(tensorflow) and frontend(keras)
- Concept of tensors
- Keras building model- construct, compile and evaluate
- Activation function and loss function
- Evaluation metrics for deep learning