Data Analytics with Python

Python

- A Python Development Environment
- A Review of Data type
- The New Class Structure
- Python Best Practices

NumPy

- Datatypes
- Universal Functions
- Indexing
- Summary Methods
- Sorting
- Computations and Broadcasting

SciPy

- Overview of SciPy
- Statistical Functions

Pandas

- Pandas Series Structure
- Series CRUD
- Indexing and Access Techniques
- Data Methods

Pandas: DataFrame

- DataFrame Construction
- DataFrame Change and Reorganization
- Indexing and Access Techniques
- Grouping, Pivoting, and Reshaping
- DataFrame CRUD

Understanding Data Visualization

- Visualization Is Storytelling
- Types of Charts
- Colors Yes and No
- Common Mistakes
- Best Practices
- Reproducibility

Matplotlib for Data Visualization

- Small Multiples
- Panda Series Plotting
- Panda Dataframe Plotting

Advanced Techniques

- Seaborn

Data Cleaning

- Importing Data: csv, xml, html, xls
- Problems of PDF Data Sources
- Transformations Data
- Missing Data
- Time Series Problems

Statistics for Understanding Data

- A/B Testing
- Hypothesis Test
- Statistical Significance, P-Values, and Confidence Intervals
- Z- and T- Statistics

Supervised learning

- Linear Regression
- Perceptron algorithm
- Neural networks
- Decision trees
- Naïve Bayes
- K-Nearest Neighbors
- Support vector machines
- Bagging and Random Forest
- Project - 1

Unsupervised learning

- Clustering (K-means and KNN)
- Hierarchical and Density-based clustering
- Feature scaling
- Dimensionality reduction
- Project – 2

Introduction to Machine learning

- What is Machine Learning?
- Why Machine Learning?
- History of Machine Learning?
- Existing application of Machine Learning
- Future of Machine Learning

Machine learning terminology

- Labels
- Data
- Categorical Data v/s Continuous Data
- Features
- Models
- regression
- Classification
- Bias
- Weight
- Inference

What is Regression?

- Simple linear regression
- Multi linear regression
- Squared error loss
- MSE(Mean Squared error loss)
- MAE(Mean Absolute error loss)
- Huber loss
- Gradient Descent
- Gradient Descent for Linear Regression

What is Classification?

- Binary Classification (Logistic regression)
- Sigmoid function
- Confusion Matrix

What is Clustering?

- K-means clustering
- Hierarchical clustering

Ensemble Techniques

- Decision Trees
- Random Forests
- Boosting

Artificial intelligence

- World of Neural Network
- What is Neural Networks
- Activation Functions
- Neural Network Structure
- Gradient Descent
- Multilayer Neural Networks
- Backpropagation
- Overfitting
- TensorFlow for Neural Network
- Computer Vision using Neural Network
- Image Convolution in computer vision
- Convolutional Neural Networks
- introduction Recurrent Neural Networks