Full Stack Data Science Program

in Artificial Intelligence, Machine Learning and Deep Learning

Program Details

Python

- Python Installation
- Jupyter Notebook Tutorial
- Variable
- Function
- Lambda Expression
- Loops
- List
- Tuple
- Set
- Dictionary
- Coding Test-1
- Assignment-1
- Assignment-2
- Assignment-3

Advance Python

- Introduction to Numpy
- Creating Arrays

- Selection and Indexing
- Basic Operations on Arrays
- Mathematical Operation on Arrays
- Linear Algebra Operation on Arrays
- Stacking Arrays
- Data Types and Type Conversion
- Assignment-4
- Introduction to Pandas
- Creating Data Frames
- Reading and Writing Operation
- Selection and Indexing
- Conditional Selection
- Assignmet-5
- Groupby
- Pivot Table
- Merge
- Join
- Concat
- Assignment-6
- Missing Value Treatment
- Drop Duplicates
- Dealing with Date Time Data
- Apply()
- Introduction to Series
- Series Operation
- Pandas Builtin Functions for Data Visualisation
- Assignment-7
- Coding Test-2

Visualisation

- Introduction To Plotly

- Scatter Plot
- Line Plot
- Scatter Matrix
- Box Plot
- Bar Chart
- Histogram
- Sun Burst Chart
- Create DashBoard

Statistics

- Central Limit Theorem
- Measure of Dispersion
- Quartiles
- Inter Quartile Ranges
- Variance
- Standard Deviation
- Z Score
- Normal Distribution
- Pearson Correlation Coefficient- R
- R Square
- Adjust R2
- Multi Colinearity Detection Techniques
- Multi Colinearity Removal Techniques
- Outliers Detection and Removal
- Assignment-8

Machine Learning

- Introduction to Machine Learning

- Difference Between Supervised & Unsupervised Learning
- Difference Between Classification and Regression
- Machine Learning Application
- Data Science Project Life Cycle
- Linear Regression
- Theory of Linear Regression
- Cost Function
- Optimization Using Gradient Descent
- Mathematical Interpretation of Gradient Descent
- Project-1 – Sales Prediction Project
- Understanding Why Linear Regression may fail?
- Model Validation Techniques
- Mean Squared Error
- Root Mean Squared Error
- Mean Absolute Error
- Polynomial Regression
- Understanding Polynomial Regression
- Implementing Polynomial Regression Using Python
- Overfitting, Underfitting, Right Fit
- Coding Test- 2- Project-2 (Finance project)
- Logistic Regression
- Understanding Logistic Regression Step by Step
- Project-3 – Retail Project
- Decision Tree and Random Forest
- ID3 Algorithm vs CART
- Entropy
- Information Gain
- Step by Step Understanding of How Decision Tree Work
- How to overcome overfitting in DT
- Cross Validation
- Bootstrap Aggregation/Bagging
- Introduction to Random Forest
- How Random Forest Works

- Feature Selection
- Model Validation Techniques
- Accuracy
- Confusion Matrix
- Classification Report
- Recall
- Precision
- Project-4- Healthcare Project
- Coding Test-5 – Project-5(Banking Project)
- Hyper parameter Tuning
- KMeans Clustering
- What is Euclidian Distance
- Introduction to Unsupervised Learning
- Step By Step Mathematical Derivation
- Pros and Cons Of K Means
- Elbow Method to Find K
- Project-6- Customer Segmentation

Deep Learning

- What is Deep Learning
- Deep Learning VS Machine Learning
- What is a Perceptron
- How Neural Network Learns
- Multi Layer Perceptron
- Activation Function
- Introduction to Keras
- What is Feed Forward Network
- Detail Explanation of ANN
- What is Cost Function
- Optimization Technique
- Vanilla Gradient Descent

- Mini Batch Gradient Descent
- Stochastic Gradient Descent
- Softmax
- Cross Entropy Loss
- MSE vs Cross Entropy
- Project-7 - Price Prediction Project
- Projet-8- Coding Test- Classification Project(IOT Data- Aviation Domain)

Image Processing , CNN & Computer Vision

- Introduction to Computer Vision
- Challenges in Computer Vision
- Introduction to Open CV
- Image Basics
- Reading and Writing Images/Videos
- Rescaling / Normalisation
- Color Mapping
- Thresholding of an Image
- Morphological Transformation
- Image Augmentation Using Keras
- What is Image Filters
- Different Kind of Filters
- Convolution
- What is Convolutional Neural network
- Pooling
- Overfitting In Deep Learning
- Drop Outs
- Project-9- X-ray Image Classification(HealthCare)

Time Series Analysis

- What is Time Series Data
- Resampling
- Time Shifting
- Interpolation
- Missing Value Treatment in Time Series
- Trend
- Seasonality
- Auto Correlation
- Time Series Decomposition
- Moving Average
- Exponential Moving Average
- Time Series Modelling Using Facebook Prophet
- Project-10- Time Series Forecasting Project

Natural Language Processing-Text Mining

- What is Unstructured Data
- Introduction to NLTK and Spacy
- Tokenization
- Stop Word Removal
- Stemming
- Lemmatization
- N-Grams
- What is Word Embedding
- Count Vectorizer
- Tf-Idf Vectorizer
- Pattern Matching
- Regular Expression
- Project-11 – Sentiment Analysis(Social Media Data)
- Project-12- Document Clustering (News Data)

Big Data Analytics - Apache Spark

- Introduction to Apache Spark
- Parallel vs Distributed Computing
- Introduction to Big Data
- Spark Installation
- Spark Vs Hadoop
- Spark Architecture
- Lazy Evaluation
- RDD
- Spark SQL & DataFrame
- Spark ML Lib
- Project-13- Retail Domain Project using Spark MLLib