GeeksforGeeks

Machine Learning

Basic & Advanced Course

Detailed Course Syllabus

1. Getting Start With AI

a. **Introduction to AI**

i. What is AI
ii. Subsets of AI

b. **How data science comes into play**

i. What is Data Science
ii. AI vs ML vs DL

2. Mastering Numpy Arrays

a. **Jupyter**

i. Jupyter Notebook Setup
ii. Jupyter Notebook Walkthrough

b. **Mastering Numpy Arrays**

i. Getting Started with Numpy
ii. Reshape and Random Numbers Generator
iii. Arithmetic Operations on Arrays
iv. Arithmetic Operations on Multiple Arrays
v. Array Sorting
vi. Array Slicing
vii. Array Merging
viii. Automating using Numpy

3. Data Analysis with Python

a. **Getting started with Pandas**

i. Getting Started with Pandas
ii. Dataset Walkthrough

b. Data Preprocessing

i. Data Preprocessing – Removing Null Value Rows
ii. Data Analysis – Numeric
iii. Data Analysis – Categorical
iv. Data Analysis – Automatic Categorical
v. Null Values Handling – Numeric
vi. Null Values Handling – Categorical
vii. Null Values Handling on Google Playstore Dataset

c. Data Analysis

i. Data Analysis with Multiple Columns
ii. Data Analysis using Conditions
iii. GroupBy in Pandas

d. Data Visualization on Heart Disease Dataset

i. Heart Disease EDA – Introduction to Kaggle
ii. Heart Disease EDA – Age(DistPlot)
iii. Heart Disease EDA – Categorical Columns (Pie Charts)
iv. Heart Disease EDA – Violin Plot
v. Heart Disease EDA – Correlation (HeatMap)
vi. Heart Disease EDA – Correlation (PairPlot)
vii. Heart Disease EDA – Correlation (JoinPlot)

e. Black Friday Sales Data Analysis

i. Black Friday – Walkthrough
ii. Black Friday – Analysing Columns
iii. Black Friday – Analysing Gender
iv. Black Friday – Analusing Age & Martial Status
v. Black Friday – MultiColumn Analysis
vi. Black Friday – Occupation and Products Analysis
vii. Black Friday – Combining Gender & MAritial Status

f. Black Friday Sales Data Analysis

i. GDP Analysis – Assignment
ii. GDP Analysis – Dataset Walkthrough

iii. GDP Analysis – GDP Growth of a Country
iv. GDP Analysis – GDP Growth on whole Dataset
v. GDP Analysis – Plotting Graphs Using Plotly
vi. GDP Analysis – Plotting Graphs in Bulk
vii. GDP Analysis – Compare GDP across Countries
viii. GDP Analysis – Compare GDP Growth Comparison

4. Machine Learning

a. Linear Regression

i. Linear Regression Intuition
ii. Forward Propagation and Cost Function in Linear Regression
iii. Gradient Descent in Linear Regression
iv. Updating the Parameters in Linear Regression
v. Detailed Mathematics behind Linear Regression
vi. Linear Regression Model from Sratch
vii. Linear Regression Model Training
viii. Linear Regression Model Prediction
ix. Linear Regression Model using ScikitLearn library

b. Multiple Linear Regression

i. Multiple Linear Regression Intuition
ii. Multiple Linear Regression Hands On
iii. Linear Regression Model Assumption
iv. Linear Regression Assumption Hands On
v. Ordinary Least Square (OLS) method
vi. Multiple Linear Regression using OLS.

c. Polynomial Linear Regression

i. Polynomial Linear Regression intuition
ii. Polynomial Linear Regression Hands On

d. Support Vector Machine

i. Support Vector Regression Intuition
ii. Support Vector Regression On Insurance Cost Prediction

e. Decision Tree

i. Decision Tree Regression Intuition
ii. Decision Tree Regression Hands On

f. **Random Forest**

i. Random Forest Regression Intuition
ii. Random Forest Regression Hands On

g. **Classification Algorithms**

i. KNN Algorithm Intuition
ii. Naïve Bayes Intuition
iii. Project Titanic – Classification

h. **Clustering Alogrithms**

i. Introduction to K-Means Clustring
ii. K-Means Initialise Centers
iii. E step in K-Means
iv. How to Plot Clusters
v. M Step in K-Means
vi. Random Init Improvement in K-Means

i. **Feature Engineering**

i. Feature Selection – with Correlation Matrix
ii. Feature Selection – with Extra Tree Classifier
iii. Feature Selection – with SelectKBest Method
iv. Principal Component Analysis (PCA) Intuition
v. PCA Implementation
vi. TSNE Intuition
vii. TSNE Implementation
viii. K-Fold Cross Validation Intuition
ix. K-Fold Cross Validation Implementation

5. Natural Language Processing

a. **Getting Started with Files**

i. Reading Data from Text-File
ii. Reading Data from Text-File Corpus
iii. Text-Preprocessing
iv. Advance Text Preprocessing
v. Writing Data on a text-file

vi. Write Data on a text-file with New Line

b. Getting Started with NLTK

i. Getting Started with NLTK
ii. Stemming & Lematization
iii. StopWords Removal
iv. Corpus & Vocabulary

c. Text Encoding

i. Word Cloud
ii. Text Encoding – Decoding
iii. Text Encoding – Decoding | Without Stop Words
iv. Guessing Title | Most Frequent Word
v. One Hot Encoding