Data Science and Machine Learning Course Content

1. Introduction
    a. What is Data Science
    b. Data Science Vs Data Mining
    c. What is Machine Learning?
        i. Some Basic Terms
        ii. Types of Machine Learning (Supervised, Unsupervised, and Reinforcement)
    d. Python Installation
        i. Python IDE
        ii. Installation of required libraries
        iii. Jupyter Notebook Interface
    e. Machine Learning Useful Package
        i. NumPy
        ii. Pandas
        iii. Matplotlib
2. Data Pre-Preprocessing
    a. Reading and Modifying a Dataset
    b. Statistics (Mean, Median, Mode, Variance, Standard deviation, Normal Distribution, Uniform Distribution, Covariance)
    c. Missing Values
    d. Outlier Detection
    e. Concatenation
    f. Dummy variable
    g. Normalization
3. Classification
    a. Supervised Learning Models - Introduction and Understanding the Data
    b. K-NN Concepts
    c. K-NN Model Development
    d. K-NN Training Set and Test-Set Creation
    e. Decision Tree Concepts
    f. Decision Tree Model Development
    g. Decision Tree - Cross-Validation
    h. Naive Bayes Concept

i. Naive Bayes Model Development
j. Logistic Regression Model Development
k. Model Evaluation Concepts
l. Model Evaluation - Calculating with Python

4. Regression
    a. Simple and Multiple Linear Regression Concepts
    b. Multiple Linear Regression - Model Development
    c. Evaluation Metrics - Concepts
    d. Evaluation Metrics - Implementation
    e. Polynomial Linear Regression Model development
    f. Random Forest Concepts
    g. Support Vector Regression Concepts
    h. Support Vector Regression Model Development
5. Clustering
    a. Introduction
    b. K-means Clustering Introduction
    c. K-means Model development
    d. K-means Model Evaluation
    e. DBSCAN Concepts
    f. DBSCAN Model Development
    g. Hierarchical Clustering Concepts
    h. Hierarchical Clustering Model
6. Hyper Parameter optimization (Model Tuning)
    a. Introduction and why Model Tuning
    b. Support Vector Regression - Model Tuning
    c. K-Means - Model Tuning
    d. k-NN - Model Tuning
    e. Overfitting and Underfitting