Session 1:

o Machine Learning in Nutshell - Done

o Supervised and Unsupervised Learning - Done

o ML Applications - Done

o Evaluating ML techniques - Done

Lab Assignments:

o Explore scikit learn Library. - Done

Session 2 &3:

o Feature engineering and Data Pre-processing: Data Preparation, Feature creation,

Data cleaning & transformation, - Done

o Data Validation & Modelling, - Done

o Feature selection Techniques, - Done

o Dimensionality reduction - Done

Lab Assignments:

o Explore Datasets Online (can refer Kaggle, UCI ML, etc.) - Done

(a) Load dataset in Google colab. - Done

(b) Print first five values and last five values in dataset. - Done

(c) check correlation between fields present in dataset - Done

Machine Learning Algorithms:

Session 4 & 5:

o Principal Component analysis (PCA) - Done

*o t-SNE*

o Clustering - Done

o Hierarchical Clustering & K means - Done

*o Distance Measure and Data Preparation – Scaling & Weighting*

Lab Assignments:

o Download any dataset from kaggle. - Done

(a) Form n no. of clusters according to your observation. - Done

(b) Get wss value for each cluster. - Done

(c) find best K value - Done

*o Explore t-SNE*

Session 6:

o Evaluation and Profiling of Clusters - Done

o Hierarchical Clustering - Done

o Clustering Case Study - Done

Lab Assignments: Implement the model hierarchical clustering on any dataset loaded

from kaggle.

Session 7:

o DBSCAN Clustering - Done

Lab Assignments: Load any dataset from kaggle, preprocess the data and build

clustering model using DBSCAN clustering. - Done

Session 8 & 9:

o Linear Regression - Done

o Logistic Regression - Done

o Polynomial Regression - Done

o Stepwise Regression - Done

o Ridge Regression - Done

o Lasso Regression - Done

o Elastic Net Regression - Done

Lab Assignments:

Download Dataset, perform linear, Ridge, Lasso, Logistic, Polynomial regression and

check for MAE, MSE, RMSE and also check F1 score and explain with conclusion. - Done

Session 10 & 11:

o Support vector Machines - Done

o Basic classification principle of SVM - Done

o Linear and Nonlinear classification (Polynomial and Radial) - Done

Lab Assignments: Download Air Quality Dataset from Kaggle Predict Air Quality Index

using Linear regression and classify it into five categories using SVM (i.e. Very good,

good, moderate, poor, worst) - Done

Session 12:

o Discriminant Analysis (Linear and Quadratic) - Done

o K-Nearest Neighbors Algorithm - Done

Lab Assignments: Load any dataset from kaggle, preprocess the data and apply KNN

Algorithm. - Done

Session 13:

o Decision Trees - Done

o Classification and Regression Trees - Done

Lab Assignments: Load any dataset from UCI Machines preprocess the data and apply

Decision tree Algorithm. - Done

Session 14:

o Bayesian analysis and Naïve Bayes classifier - Done

o Assigning probabilities and calculating results - Done

Lab Assignments: Load any dataset preprocess the data and apply Naïve Bayes

Algorithm. - Done

Session 15 & 16:

o Concept of Model Ensembling - Done

o Random forest, Gradient boosting Machines, Model Stacking - Done

Lab Assignments: Implement Random Forest and gradient boosting algorithm on any

dataset. - Done

Session 17 & 18:

o Association rules mining - Done

o Apriori and *FP-growth algorithms*

Lab Assignments: Implement Food Product recommendation system for shop using

Apriori.

Session 19 & 20:

o Moving average, Exponential Smoothing, - Done

o Holt’s Trend Methods, - Done

o Holt-Winters’ Methods for seasonality - Done

Lab Assignments: Implement the smoothing models on the time series data.

Session 21 & 22:

o Auto-correlation (ACF & PACF), - Done

o Auto-regression, - Done

o Auto-regressive Models, - Done

o Moving Average Models - Done

o ARMA & ARIMA - Done

Lab Assignments:

o Download one data set and calculate Auto correlation. - Done

o Explain ARMA and ARIMA model in time series and Explain difference between

them by applying on any dataset. - Done

Session 23:

o ML in Real-Time - Done

o Algorithm Performance Metrics - Done

o ROC and AOC - Done

o Confusion Metrix - Done

o F1 Score - Done

o MSE and MAE - Done

Lab Assignments:

o Calculate Confusion matrix, F1 score, MSE, RMSE, MAE scores on any model. - Done

o Load a dataset in Jupyter notebook and implement any classification algorithm

and generate classification report and accuracy score. - Done

*Session 24 & 25:*

*o Recommendation Systems*

*o Data Collection & Storage, Data Filtering*

*o Collaborative Filtering*

*o Factorization Methods*

*o Evaluation Metrics: Recall, Precision, RMSE, Mean Reciprocal Rank, MAP*

*at K, NDCG*

*Lab Assignments: Download Movie dataset from kaggle and implement the movie*

*recommendation system.*

Session 26:

*o Anomaly detection*

*o Point, Contextual and Collective Anomaly*

*o Supervised and Unsupervised anomaly detection*

*Lab Assignments: Apply Anomaly Detection on dataset and calculate the accuracy.*

*Case Studies:*

* Usage of ML algorithms, Algorithm performance metrics (confusion matrix*

*sensitivity, Specificity, ROC, AOC, F1score, Precision, Recall, MSE, MAE)*

* Credit Card Fraud Analysis*

* Intrusion Detection system*