

ASSIGNMENT-II

Deadline: 2 February 2025

Consider the system modeled in Assignment-I and perform the following analysis:

1. Create a data-driven model for loadflow where the input must be bus demand (Active and Reactive) and output must be the bus voltages of your system. Perform a detailed comparison of developed models and apply atleast six machine learning algorithms. The database should contain atleast 10000 samples.

The following components are must in the report:

(i) Summary of the key results (See Table below)

	LR	SVM	DT	ANN	RF	XGB
Database generation time (min)						
Training RMSE						
Training MAPE						
Training Time (min)						
Testing RMSE						
Testing MAPE						
Testing Time (s)						

(ii) Visualization of the Input data (Output vs Input)

(iii) Visualization of the Output (Predicted vs Actual)

(iv) Hyper-parameter tuning of at least one machine learning algorithms (ANN, RG and XGB)

2. Develop a data-driven model for classifying the fault type (Any three kind of faults). The model for phase and ground faults should be different. Perform a detailed comparison of developed models and apply atleast five machine learning algorithms. The database should contain atleast 1000 samples.

The following components are must in the report:

(i) Summary of the key results (See Table below)

	LR	SVM	DT	ANN	RF	XGB
Database generation time (min)						
Training Accuracy						
Training Precision						
Training Recall						
Training F1-Score						
Training Time (min)						
Testing Accuracy						
Testing Precision						
Testing Recall						
Testing F1-Score						
Testing Time (min)						

(ii) Visualization of the Input data (Output vs Input)

(iii) Visualization of the Output (Predicted vs Actual)

(iv) Hyper-parameter tuning of at least one machine learning algorithms (ANN, RG and XGB)

All the results should be submitted in.ppt format. The ppt file should have minimum theory and only necessary results and concise explanation.