Step By Step Procedure F4 ML

1)Problem Definition

->Brief overview of the problem

2)Data Collection/Set

->Clearly define the problem to be solved through multiclass classification.

->Discuss the significance of the classes and their relevance in the problem domain.

->gathering a comprehensive dataset containing features and labels.

3) Data Preprocessing

->Handling missing values and duplicates.

->Encoding categorical variables using techniques like one-hot encoding or label encoding.

->Scaling numerical features for uniformity using normalization.

->Feature engineering to enhance model performance.

4) Data Exploration and Visualization

->Visualization methods such as histograms, scatter plots,violin plots and box plots.

->Identifying patterns and anomalies that may impact model performance.

5) Finding and Removal of Outliers

->Identifying outliers using statistical method of z-score

->handling outliers of removing

6) Feature Selection Techniques

->Overview of filter methods for feature selection.

->Explanation of correlation analysis and mutual information.

->Performing feature selection guided by statistical metrics and domain knowledge.

7)Data Splitting

8) Neural Network Architecture Design

->Choosing the appropriate number of layers and nodes based on problem complexity.

->Selection of activation functions for hidden layers and output layer.

->Determining the loss function tailored to multiclass classification tasks.

9)Model Compilation

->Configuring the neural network model with the optimizer, learning rate, and evaluation metrics.

10)Model Training

->Training the compiled model on the training dataset.

->Hyperparameter adjustments such as batch size and number of epochs.

->Monitoring training progress using validation data to prevent overfitting.

11)Model Evaluation

->Evaluating the trained model on the validation dataset.

->Calculation of evaluation metrics such as accuracy, precision, recall