Assignment 4

Problem Statement

To design and build CNN model for identification of Dysarthria disease

Data:

https://www.kaggle.com/datasets/iamhungundji/dysarthria-detection

Create a Kaggle notebook in this dataset. Perform all the tasks in this notebook.

Task:

1. Read data.csv in pandas
2. Visualize the waveplot, MFCC, and Mel Spectrogram for any 1 random sample of dysarthric male, dysarthric female, non-dysarthric male, and non-dysarthric female.
3. Comment on the output.
4. Define a function to create 256 MFCC features for any given audio file.
5. Apply the function on all audio files listed in data.csv
6. Split the data into training and validation by a ratio of 90:10.
7. Reshape the MFCC features for CNN.
8. Build the CNN model with padding on a training set.
    a. Include some dropout layers.
    b. Use metrics as recall score in compile function.
    c. Adam optimisers with different learning rates, beta1 and beta2. Select the best parameter based on your evaluation
9. Evaluate the validation set.
10. Calculate and comment on ROC AUC score, recall score and confusion matrix.