ASSIGNMENT

Building LSTM and GRU Models for Sentiment Analysis
In this assignment, you will build LSTM and GRU models for sentiment analysis using the Twitter US Airline Sentiment dataset. The dataset contains 14,640 tweets, labelled as either positive, negative, or neutral sentiment towards US airlines.

Part 1:

1. Load the dataset using the pandas library.
2. Convert the text data into numerical data using word embedding.
3. Pad the sequences to a fixed length to prepare the data for input to the models.
4. Split the data into training and testing sets with a 70:30 ratio.

Part 2:

1. Build an LSTM model with the following layers:
2. An embedding layer with an input dimension of the vocabulary size and an output dimension of 128.
3. A LSTM layer with 128 units.
4. A dense output layer with a softmax activation function.
5. Train the model using the training data and validate the results using the testing data.
6. Evaluate the model's performance by calculating accuracy, precision, recall, and F1 score.

Part 3:

1. Build a GRU model with the following layers:
2. An embedding layer with an input dimension of the vocabulary size and an output dimension of 128.
3. A GRU layer with 128 units.
4. A dense output layer with a softmax activation function.
5. Train the model using the training data and validate the results using the testing data.
6. Evaluate the model's performance by calculating accuracy, precision, recall, and F1 score.

Part 4:

1. Compare the performance of the LSTM and GRU models.
2. Analyse the models' performance in terms of their ability to correctly classify the categories.