**Assignment No: 6**

**Problem Statement:-**

Perform sentiment analysis using an **LSTM** network or **GRU**.

**Theory:-**

**Sentiment Analysis** is the task of determining the emotional tone behind a series of words. It is commonly used to analyze customer reviews, social media comments, or any text that contains subjective opinions.

* **LSTM (Long Short-Term Memory)** and **GRU (Gated Recurrent Unit)** are types of RNNs that are well-suited for handling long-term dependencies in text sequences.

**Methodology:-**

1. **Data Collection**:
   * Use a labeled dataset such as **IMDB** for movie reviews or **Twitter** sentiment datasets.
   * Preprocess the text data by tokenizing and padding sequences to ensure uniform input length.
2. **Model Architecture**:
   * Build an LSTM or GRU-based RNN using **Keras** or **TensorFlow**.
   * Use embedding layers to convert words into dense vectors before feeding them into the LSTM/GRU layers.
3. **Training**:
   * Train the model on the labeled dataset using **binary\_crossentropy** for binary sentiment classification (positive vs. negative).
   * Use accuracy and F1-score as evaluation metrics.
4. **Prediction**:
   * Test the model on unseen reviews or texts to predict sentiment.

**Conclusion:-**

We successfully implemented an LSTM/GRU-based sentiment analysis model, accurately classifying text as positive or negative based on the input.