**Lab Assignment 3**

**I. Introduction:**

In this Lab Assignment I tried to implement a Convolutional Neural Networks with the help RNN and LSTM for text classification which is to find the best method that gives the best accuracy and very less loss.

**II. Objectives:**

The Objective is to compare the results of text classification using CNN, RNN and LSTM

**III. Approaches/Methods:**

1. Used LSTM which is to avoid the vanishing or exploding gradients.
2. Used CNN and RNN with a multi-layer Neural Network.

**IV. Workflow:**

1. First data is imported using from Keras package called IMDB
2. It contains a corpus of 25000 samples.
3. Load the data with max\_features on it
4. Extract pad sequences of length “max\_length”
5. Apply to the model max\_features along with that one of the methods either LSTM, RNN or CNN to the train set as well as test set
6. Apply Optimizer, Activation function and accuracy matrix to the above set.
7. Fit the model to the training data set along with parameters such as batch\_size and epochs.
8. Validate the same to the test data.
9. Evaluate the model with the length of batch\_size.
10. **CNN output:**

**A screenshot of a social media post

Description generated with very high confidence**

1. **RNN output:**

A screenshot of a social media post

Description generated with very high confidence

1. **LSTM output:**

**A screenshot of a social media post

Description generated with very high confidence**

**V. DataSets:**

The data sets used here is IMDB data where the Sample contains a corpus of 25000 samples.

**VI. Parameters:**

Parameters used are batch size, number of epochs, max\_length (length of a sentence cut) and max\_features which determines the features observed in the text.

**VII. Evaluation and Discussion:**

As I have observed it is **RNN** accuracy is **0.81**, **LSTM** accuracy is **0.834** and **CNN** accuracy is **0.79**. So, I found that LSTM gives a good accuracy compared to CNN and RNN as it uses Adam optimizer and sigmoid activation function that avoids vanishing gradients and gives a better accuracy.

1. Batch size 🡪 1000
2. Epochs 🡪 2
3. Total no. of samples 🡪 25000

**VIII. Conclusion:**

LSTM gives a good accuracy compared to CNN and RNN as it computes “**binary\_crossentropy**” loss with sigmoid activation function that avoids vanishing gradients and gives a better accuracy.