A Comparative Study of Deep Learning Models for Bengali Sentiment Analysis

Objective:

This study aims to systematically evaluate and compare the performance of various deep learning models in the context of Bengali sentiment analysis and consider the performance of well-known sentiment analysis models on Bengali text in various contexts, including news articles, social media, and user-generated content. It considers factors like slang, regional differences, and subtleties in sentiment expression to determine the advantages and disadvantages of each model within the unique language and cultural framework of Bengali. The study also looks at the potential transferability of information from models trained on multiple languages and investigates the effect of using pre-trained language models on Bengali sentiment analysis. The ultimate objective is to provide insights that can direct the creation of sentiment analysis models that are optimized and especially suited for Bengali, tackling the language's particular difficulties.

Methodology:

- **Dataset Collection:**

  Assemble a diverse dataset of Bengali language text, incorporating samples from social media, news sources, comment sections and other relevant domains. Then we will pre-process the data to ensure uniformity and suitability for the sentiment analysis task.

- **Working Process:**

  Accurately analyzing sentiments represented in the Bengali language is our main objective. Consequently, models that have demonstrated efficacy in sentiment analysis assignments will be given priority. We have chosen some models for our investigation based on the specified criteria which are GRU, CNN, BiLSTM, BERT and Bangla Multiclass Sentiment Analysis Model. We will vary different parameters such as train-test ratio, input lengths, epoch, document domains, Sequential representation of words or tokens etc.

- **Statistical analysis:**

  We will use Accuracy, Precision, Recall (Sensitivity) and F1-Score to show comparison. Then we will take advantage of appropriate statistical tests to verify the results.