NLP Assignment 2 Report

Ujjwal Kishor Sahoo (21293)

Here we have given a problem of binary text classification across three distinct datasets: Hate, Humor, and Sarcasm. Each dataset contained training and validation files, with the objective being to categorize text samples into one of two classes.

First, a custom Word2Vec model was applied from scratch utilizing the Skip-gram method. The model was trained on the integrated textual information from all three datasets, employing a 100-dimensional embedding space. The purpose of this model was to get the embeddings for all three datasets, which can be further used for the classification task.

The base model was built utilizing Feedforward Neural Networks (FFNNs) with a layer maximum of 64 units. Hyperparameter tuning was conducted with Keras Tuner to determine the optimal architecture and optimizing hyperparameters, including the different training setups such as Adam, AdamW, or SGD. The trained models were then compared on the test set of each dataset with accuracy and macro F1 score as the metrics.

For the Hate dataset, the end model obtained 56.89% accuracy and a macro F1 value of 0.5592. For the Humor dataset, the model achieved an accuracy of 59.66% and a macro F1 value of 0.3737. Finally, the Sarcasm dataset produced an accuracy of 84.19% with a macro F1 value of 0.7073. These outcomes demonstrate the efficiency of using tailored Word2Vec embeddings together with an optimized FFNN model for binary classification on different textual domains.

You can click Notebook to visit the colab notebook of the assignment and GitHub to view the different model.keras files.