INTERNSHIP CAPSTONE PROJECT ABSTRACT

TITLE: NEXT WORD PREDICTION MODEL USING NEURAL NETWORKS

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Next word prediction plays a crucial role in various natural language processing (NLP) applications, including machine translation, speech recognition, and text generation. This project employs the power of neural networks to implement the next word prediction model. The aim is to develop an accurate and robust model that can effectively predict the most probable word given a sequence of preceding words.

The model utilizes the power of neural networks, specifically recurrent neural networks (RNNs) and long short-term memory (LSTM) networks, to capture the contextual information and dependencies among words in a given text sequence. The model is trained on a text dataset to learn the underlying patterns and relationships between words. The training process involves feeding the model with input sequences of words. The network parameters were optimized using Adam Optimizer to minimize the prediction error (Loss).

To improve the prediction accuracy, the model incorporates various techniques such as word embeddings, which represent words as dense vectors to capture semantic similarities, and attention mechanisms that help the model focus on relevant parts of the input sequence. These techniques enable the model to effectively handle long-term dependencies and capture the intricate relationships between words.

The model was evaluated using loss and accuracy. After 100 epochs of training the model, a minimal loss of 0.5207 and an accuracy of 0.8632 (86.32%) was recorded.

The results obtained from the experiments demonstrate that the neural network-based next word prediction model achieves high accuracy. The model successfully captures the contextual information and dependencies among words, making it capable of generating coherent and contextually appropriate predictions. The performance improvements are particularly notable in challenging scenarios, such as handling rare or ambiguous words.

The implications of this project are substantial, as accurate next word prediction models have significant applications in various fields, including content generation, virtual assistants, and predictive typing. The model's ability to generate contextually relevant predictions can enhance user experience, facilitate efficient communication, and improve the overall quality of NLP systems.

In conclusion, this project presents a next word prediction model that utilizes neural networks to achieve accurate and contextually appropriate word predictions.