

Reflective Journal

Learning Insights

Throughout this lab, I explored the process of fine-tuning a pre-trained BERT model, specifically DistilBERT, for product review classification. I gained hands-on experience in:

- Formatting the dataset for NLP tasks
- Loading and implementing a pre-trained BERT model using the transformers library
- Training and testing the model for sentiment classification
- Getting predictions on the test data

The lab reinforced fundamental machine learning concepts such as transfer learning, tokenization, and model optimization. I particularly appreciated seeing how pre-trained models like BERT can adapt to specific tasks with relatively small datasets.

Challenges

One of the main challenges I faced was resource management, as BERT's high computational demands led to memory limitations, forcing me to restart the kernel and reduce batch sizes. This experience taught me the importance of monitoring GPU/CPU usage during model training, adjusting hyperparameters like batch size to prevent memory overflow, and efficiently debugging when working with large NLP models. Another conceptual challenge was understanding the role of attention mechanisms in transformers. Additionally, the final validation loss decreased in comparison with the previous epochs, indicating that the model is improving its performance on unseen data. A lower validation loss suggests better generalization, meaning the model is learning useful patterns rather than just memorizing the training data.

Personal Growth

This lab significantly deepened my understanding of NLP and transfer learning. One of the most surprising aspects was how well a pre-trained model like BERT can generalize across different text classification tasks with minimal fine-tuning. Additionally, I became more confident in working with Hugging Face's transformers library, which is a powerful tool for modern NLP applications. I see great potential in applying these skills to real-world AI projects.

Critical Reflection

I would experiment with alternative model architectures like RoBERTa or ALBERT to assess their performance differences. This lab has raised questions such as how fine-tuned BERT models can be optimized for real-time use and the impact of fine-tuning on imbalanced datasets. Overall, this lab was an excellent opportunity to connect theoretical knowledge with hands-on applications in NLP. Fine-tuning BERT has enhanced my technical abilities and expanded my understanding of the ever-evolving field of machine learning.