Practical 1: Sentiment Analysis – Simple ANN & Transformers

Task 1.1

Create a simple model that analyzes text using an artificial neural network (ANN).

A small dataset of product reviews that have been labelled as negative (0) or positive (1) is provided in the Files - Exercises - Lab 1 folder, along with some code needed to extract information.

A suggested approach is first to try to train a network on the given data.

When that task has been concluded, improve the model performance by training with more data, using a dataset with a broader range of labels, using word embeddingsto create unique sentence embeddings.

Task 1.2: Transformers Implementation

For this task, you will implement your transformer in PyTorch. You are instructed to follow this link: Tranformers in Pytorch.

Task 1.2: (Alternative)

If you find any problems with the previous code, links, or set-up (due to Amazon or anything else), we offer you another alternative to developing your own transformer.

You can follow Andrej Karpathy tutorial for a NanoGPT here: YouTube and use his GitHub with the code here: NanoGPT or you can develop your own code if you want.

The only requirement is to standardise your training data. Make it the same across your implementations.

Task 1.3 Comparison

Here, you should compare of both models; you are requested to use the same test dataset for both ANN and the transformer to answer the following:

- Compare the performance of the two models and explain in which scenarios you would prefer one over the other.
- How did the two models' complexity, accuracy, and efficiency differ? Did one model outperform the other in specific scenarios or tasks? If so, why?
- What insights did you obtain concerning data amount to train? Embedding utilized? Architectural choices made?