Assignment 1

Report Submission Due: 21 March, 2023 (before 11:59 pm)

Submission: Submit to NTULearn (Assignments → Assignment 1 → Report) with subject "AI6127-Ass1-YourStudentID".

Topic: Deep Learning models for Sentiment Classification

In this assignment, we will implement different deep learning models for sentiment classification.

Example code base:
https://colab.research.google.com/drive/1uOYVQXKpQKDkK435ZxKt5c6DFulfxfa7?usp=sharing

In the code base, you are given a sample RNN model to classify the sentiment of sentences in iMDB dataset.

Tasks:

1. Warm up: Read, understand, and reimplement the example in the code base.
2. Conduct experiments with different optimizers: SGD, Adam, Adagrad and record the experimental results
3. Use Adam optimizer, conduct experiments with different number of epochs: 5, 10, 20, and 50.
4. Use Adam optimizer and 50 epochs, download and use pretrained Word2Vec embeddings as initialization of the models; compare the performance with the previous one
   - You can refer to here https://stackoverflow.com/questions/49710537/pytorch-gensim-how-to-load-pre-trained-word-embeddings on how to initialize the model using Word2Vec
   - Pretrained Word2Vec can be downloaded here https://drive.google.com/file/d/0B7XkCwpI5KDYNlNUTTlSS21pQmM/edit?usp=sharing
5. Use Adam optimizer, 50 epochs and randomly initialized embeddings, run the experiments with the following models:
   - One-layer feed forward neural network, hidden dimension is 500.
   - Two-layer feed forward neural network, hidden dimensions are 500 and 300.
   - Three-layer feed forward neural network, hidden dimensions are 500, 300, and 200
   - CNN model (with three feature maps 1, 2, and 3)
   - LSTM model
   - Bi-LSTM model

Report:

- Summarize the results of experiments (better in tables)

- Analysis, comparison, and explanation about the results (e.g., why there is difference between with and without Word2Vec? why this model is better than another model? i.e.)
- The format is free style. Try to be concise and not more than 4 pages
- The deadline is **11:59pm, 21 March 2023**