Project report – Group LGD

1.What are the names and NetIDs of all your team members? Who is the captain? The captain will have more administrative duties than team members.

Team members: Zhihao Xu (zhihaox3), Qikai Yang (qikaiy2), Hang Qi (hangq2).

Captain: Zhihao Xu

2.What is your free topic?

Our free topic is Sentiment Analysis for IMDB Movie Reviews. It works with the Large Movie Review Dataset. We train models to detect and classify the sentiment of written text. More specifically, we feed a movie review into a model and have it predict whether it is a positive or negative movie review. Convolutional Neural Network and Recurrent Neural Network are involved in this project. We evaluate our work with the precision rate on test set.

3.Which programming language do you use?

We use Python on jupyter notebook.

4.What device and computational resources do you use?

We use both Colab and a Nvidia GPU and it works on both devices.

5. What parameters do you use?

For CNN:

Embedding size = 128, out size = 64, dropout = 0.5, learning rate = 5e-4, epochs = 25, batch size = 32

For RNN:

Embedding size = 128, hidden size = 128, num layers = 2, dropout = 0.5, learning rate = 5e-4, epochs = 20, batch size = 32

6. Results:

For CNN:

[TRAIN] Epoch: 1 Loss: 0.5790 Train Accuracy: 68.72%

[TRAIN] Epoch: 2 Loss: 0.4255 Train Accuracy: 80.66%

[TRAIN] Epoch: 3 Loss: 0.3159 Train Accuracy: 87.33%

[TRAIN] Epoch: 4 Loss: 0.2178 Train Accuracy: 92.57%

[TRAIN] Epoch: 5 Loss: 0.1322 Train Accuracy: 97.02%

[TRAIN] Epoch: 6 Loss: 0.0712 Train Accuracy: 99.25%

[TRAIN] Epoch: 7 Loss: 0.0349 Train Accuracy: 99.91%

[TRAIN] Epoch: 8 Loss: 0.0177 Train Accuracy: 99.99%

[TRAIN] Epoch: 9 Loss: 0.0096 Train Accuracy: 100.00%

[TRAIN] Epoch: 10 Loss: 0.0057 Train Accuracy: 100.00%

[TRAIN] Epoch: 11 Loss: 0.0038 Train Accuracy: 100.00%

[TRAIN] Epoch: 12 Loss: 0.0039 Train Accuracy: 99.99%

[TRAIN] Epoch: 13 Loss: 0.0019 Train Accuracy: 100.00%

[TRAIN] Epoch: 14 Loss: 0.0028 Train Accuracy: 99.99%

[TRAIN] Epoch: 15 Loss: 0.0007 Train Accuracy: 100.00%

[TRAIN] Epoch: 16 Loss: 0.0004 Train Accuracy: 100.00%

[TRAIN] Epoch: 17 Loss: 0.0003 Train Accuracy: 100.00%

[TRAIN] Epoch: 18 Loss: 0.0002 Train Accuracy: 100.00%

[TRAIN] Epoch: 19 Loss: 0.0002 Train Accuracy: 100.00%

[TRAIN] Epoch: 20 Loss: 0.0001 Train Accuracy: 100.00%

[TRAIN] Epoch: 21 Loss: 0.0001 Train Accuracy: 100.00%

[TRAIN] Epoch: 22 Loss: 0.0001 Train Accuracy: 100.00%

[TRAIN] Epoch: 23 Loss: 0.0000 Train Accuracy: 100.00%

[TRAIN] Epoch: 24 Loss: 0.0000 Train Accuracy: 100.00%

[TRAIN] Epoch: 25 Loss: 0.0000 Train Accuracy: 100.00%

[TEST] Loss: 1.1053 Accuracy: 77.24%

For RNN:

[TRAIN] Epoch: 1 Loss: 0.6608 Train Accuracy: 59.66%

[TRAIN] Epoch: 2 Loss: 0.5120 Train Accuracy: 75.26%

[TRAIN] Epoch: 3 Loss: 0.3949 Train Accuracy: 82.94%

[TRAIN] Epoch: 4 Loss: 0.3119 Train Accuracy: 87.14%

[TRAIN] Epoch: 5 Loss: 0.2346 Train Accuracy: 91.18%

[TRAIN] Epoch: 6 Loss: 0.1618 Train Accuracy: 94.12%

[TRAIN] Epoch: 7 Loss: 0.1110 Train Accuracy: 96.20%

[TRAIN] Epoch: 8 Loss: 0.0677 Train Accuracy: 97.62%

[TRAIN] Epoch: 9 Loss: 0.0444 Train Accuracy: 98.61%

[TRAIN] Epoch: 10 Loss: 0.0313 Train Accuracy: 98.92%

[TRAIN] Epoch: 11 Loss: 0.0209 Train Accuracy: 99.30%

[TRAIN] Epoch: 12 Loss: 0.0251 Train Accuracy: 99.14%

[TRAIN] Epoch: 13 Loss: 0.0146 Train Accuracy: 99.43%

[TRAIN] Epoch: 14 Loss: 0.0128 Train Accuracy: 99.53%

[TRAIN] Epoch: 15 Loss: 0.0234 Train Accuracy: 99.22%

[TRAIN] Epoch: 16 Loss: 0.0116 Train Accuracy: 99.61%

[TRAIN] Epoch: 17 Loss: 0.0118 Train Accuracy: 99.61%

[TRAIN] Epoch: 18 Loss: 0.0124 Train Accuracy: 99.59%

[TRAIN] Epoch: 19 Loss: 0.0149 Train Accuracy: 99.44%

[TRAIN] Epoch: 20 Loss: 0.0041 Train Accuracy: 99.85%

[TEST] Loss: 2.1454 Accuracy: 76.86%

7. Link to presentation:

https://youtu.be/oXotyANccno