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問題 3 （Problem 3)のレポート

Program

- ★ Link Colab (Problem 3): Problem3_Labwork6.ipynb

- ★ Link GitHub: Artificial-Intelligence-IE229.M21.CNCL

Execution Results

epoch 0 : loss 217280.26123332977

epoch 1 : loss 187314.51201152802

epoch 2 : loss 171946.59520292282

epoch 3 : loss 162043.59267187119

epoch 4 : loss 151222.49192997813

epoch 5 : loss 144939.6614573896

epoch 6 : loss 140015.10392573476

epoch 7 : loss 135008.0783777237

epoch 8 : loss 131256.10971072316

epoch 9 : loss 127570.40578329563

epoch 10 : loss 124299.85424540937

epoch 11 : loss 121401.74102421105

epoch 12 : loss 118755.23666957021

epoch 13 : loss 116365.78238460422

epoch 14 : loss 113931.68533404171

epoch 15: loss 111849.6057575345

epoch 16: loss 110578.12493395805

epoch 17: loss 109479.10164439678

epoch 18: loss 108375.03049015999

epoch 19: loss: 107315.40601094067

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total: 1268

bleu: 0.10033195446730946

Explanation

First, we are building the model Bidirectional LSTM, with fine tune hyperparameters.

★ The first training, build a model that has an Embedding feature number = 500,

dropout with p = 0.2, learning rate = 0.0001, hidden feature number of LSTM = 512,

epochs = 10, batch size = 128.

Output	bleu: 0.05002653860452189

★ Build a model that has an Embedding feature number = 256, dropout with p = 0.1,

learning rate = 0.0001, hidden feature number of LSTM = 516, add 1 a

dense_output, epochs = 20, batch size = 128.

Output	bleu: 0.06727238576000198

★ Build a model that has an Embedding feature number = 500, dropout with p = 0.2, learning rate = 0.0001, hidden feature number of LSTM = 512, epochs = 20, batch size = 128.

Output	bleu: 0.06942979589406871

★ Build a model that has an Embedding feature number = 256, dropout with p = 0.1, learning rate = 0.0001, hidden feature number of LSTM = 516, add 1 a dense_output, epochs = 40, batch size = 128.

Output	bleu: 0.07413500685516883

★ Build a model that has an Embedding feature number = 500, dropout with p = 0.2, learning rate = 0.001, hidden feature number of LSTM = 512, epochs = 20, batch size = 128.

Output	bleu: 0.07790628280631366

★ Build a model that has an Embedding feature number = 500, dropout with p = 0.1, learning rate = 0.001, hidden feature number of LSTM = 512, add 1 a dense_output, epochs = 20, batch size = 64.

Output	bleu: 0.09107447172513936

★ Build a model that has an Embedding feature number = 500, dropout with p = 0.2, learning rate = 0.001, hidden feature number of LSTM = 516, epochs = 20, batch size = 64.

Output	bleu: 0.09593219314336811

Conclusion

★ We have built Bidirectional LSTM, adjusting hyperparameters like: dropout with p = 2, the Embedding feature number = 500, hidden feature number of LSTM = 512, and epoch = 20. The result changed to about 10.03%.

Future work

★ We will try model seq2seq: Attention model or model transformer.

References

1. Sentiment Analysis with Pytorch — Part 4 — LSTM¥BiLSTM Model (Last visited: 07/07/2022)

2. LSTM (Last visited: 07/07/2022)