

Data Mining (Homework 4)

2018/12/7

1. RNN

	Without Dropout	Dropout
Model Structure	<p>Parameters: 157,841</p>	<p>Parameters: 157,841</p>
Accuracy		
Loss		
Testing Accuracy	0.7777777724795871	0.8444444391462538

LSTM

	Without Dropout	Dropout																																																																																																
Model Structure	<p>Parameters: 167,425</p> <pre> graph TD Input[1225350293936] --> Embedding10[embedding_10: Embedding] Embedding10 --> LSTM3[lstm_3: LSTM] LSTM3 --> Dense28[dense_28: Dense] Dense28 --> Dense29[dense_29: Dense] Dense29 --> Dense30[dense_30: Dense] </pre> <table border="1"> <tr> <td>embedding_10: Embedding</td> <td>input: (None, 100)</td> <td>output: (None, 100, 32)</td> </tr> <tr> <td>lstm_3: LSTM</td> <td>input: (None, 100, 32)</td> <td>output: (None, 32)</td> </tr> <tr> <td>dense_28: Dense</td> <td>input: (None, 32)</td> <td>output: (None, 128)</td> </tr> <tr> <td>dense_29: Dense</td> <td>input: (None, 128)</td> <td>output: (None, 256)</td> </tr> <tr> <td>dense_30: Dense</td> <td>input: (None, 256)</td> <td>output: (None, 1)</td> </tr> </table>	embedding_10: Embedding	input: (None, 100)	output: (None, 100, 32)	lstm_3: LSTM	input: (None, 100, 32)	output: (None, 32)	dense_28: Dense	input: (None, 32)	output: (None, 128)	dense_29: Dense	input: (None, 128)	output: (None, 256)	dense_30: Dense	input: (None, 256)	output: (None, 1)	<p>Parameters: 167,425</p> <pre> graph TD Input[1225365794712] --> Embedding11[embedding_11: Embedding] Embedding11 --> Dropout9[dropout_9: Dropout] Dropout9 --> LSTM4[lstm_4: LSTM] LSTM4 --> Dense31[dense_31: Dense] Dense31 --> Dropout10[dropout_10: Dropout] Dropout10 --> Dense32[dense_32: Dense] Dense32 --> Dense33[dense_33: Dense] </pre> <table border="1"> <tr> <td>embedding_11: Embedding</td> <td>input: (None, 100)</td> <td>output: (None, 100, 32)</td> </tr> <tr> <td>dropout_9: Dropout</td> <td>input: (None, 100, 32)</td> <td>output: (None, 100, 32)</td> </tr> <tr> <td>lstm_4: LSTM</td> <td>input: (None, 100, 32)</td> <td>output: (None, 32)</td> </tr> <tr> <td>dense_31: Dense</td> <td>input: (None, 32)</td> <td>output: (None, 128)</td> </tr> <tr> <td>dropout_10: Dropout</td> <td>input: (None, 128)</td> <td>output: (None, 128)</td> </tr> <tr> <td>dense_32: Dense</td> <td>input: (None, 128)</td> <td>output: (None, 256)</td> </tr> <tr> <td>dense_33: Dense</td> <td>input: (None, 256)</td> <td>output: (None, 1)</td> </tr> </table>	embedding_11: Embedding	input: (None, 100)	output: (None, 100, 32)	dropout_9: Dropout	input: (None, 100, 32)	output: (None, 100, 32)	lstm_4: LSTM	input: (None, 100, 32)	output: (None, 32)	dense_31: Dense	input: (None, 32)	output: (None, 128)	dropout_10: Dropout	input: (None, 128)	output: (None, 128)	dense_32: Dense	input: (None, 128)	output: (None, 256)	dense_33: Dense	input: (None, 256)	output: (None, 1)																																																												
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2. 發現與討論：例如 RNN 與 LSTM 的準確度比較、加入 Dropout 後的 Loss 圖變化、是否有 Overfitting/Underfitting 的情況發生等。

從 RNN 跟 LSTM 的實驗中發現在網路中加入 Dropout layer 後，對 training data 的 fitting 程度都會降低，也就是說 Accuracy 不會升到太高(Loss 也不會降到太低)，而 validation data 的 loss 不會有飆升的現象，說明了加入 Dropout 可以避免網路在 training 的時候 overfitting。