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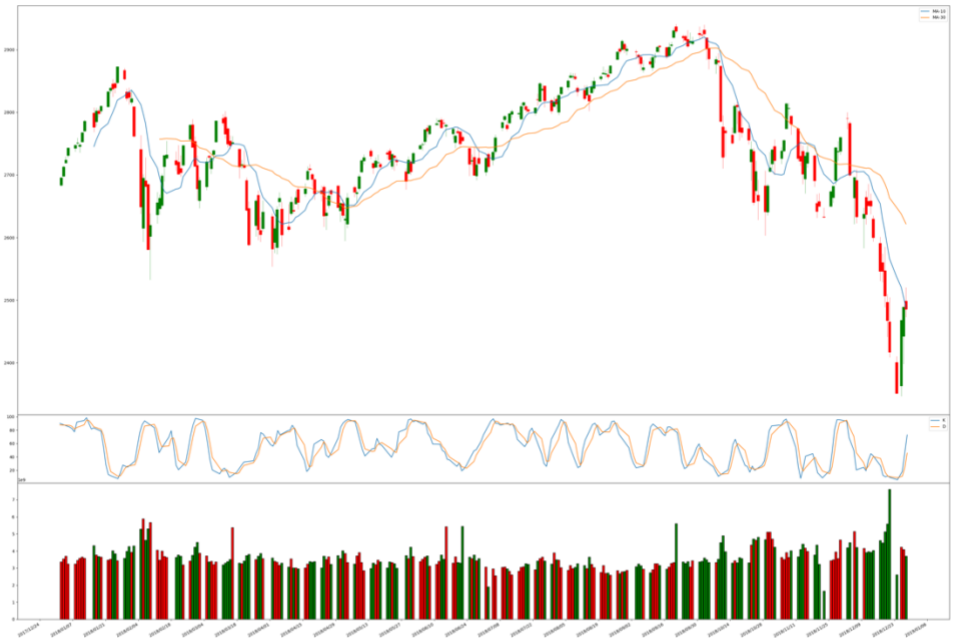
2019 Fall EE5183 FinTech - Homework 4

Deep learning Model: Recurrent Neural Network

i. Candlestick chart & KD line chart & Volume bar chart



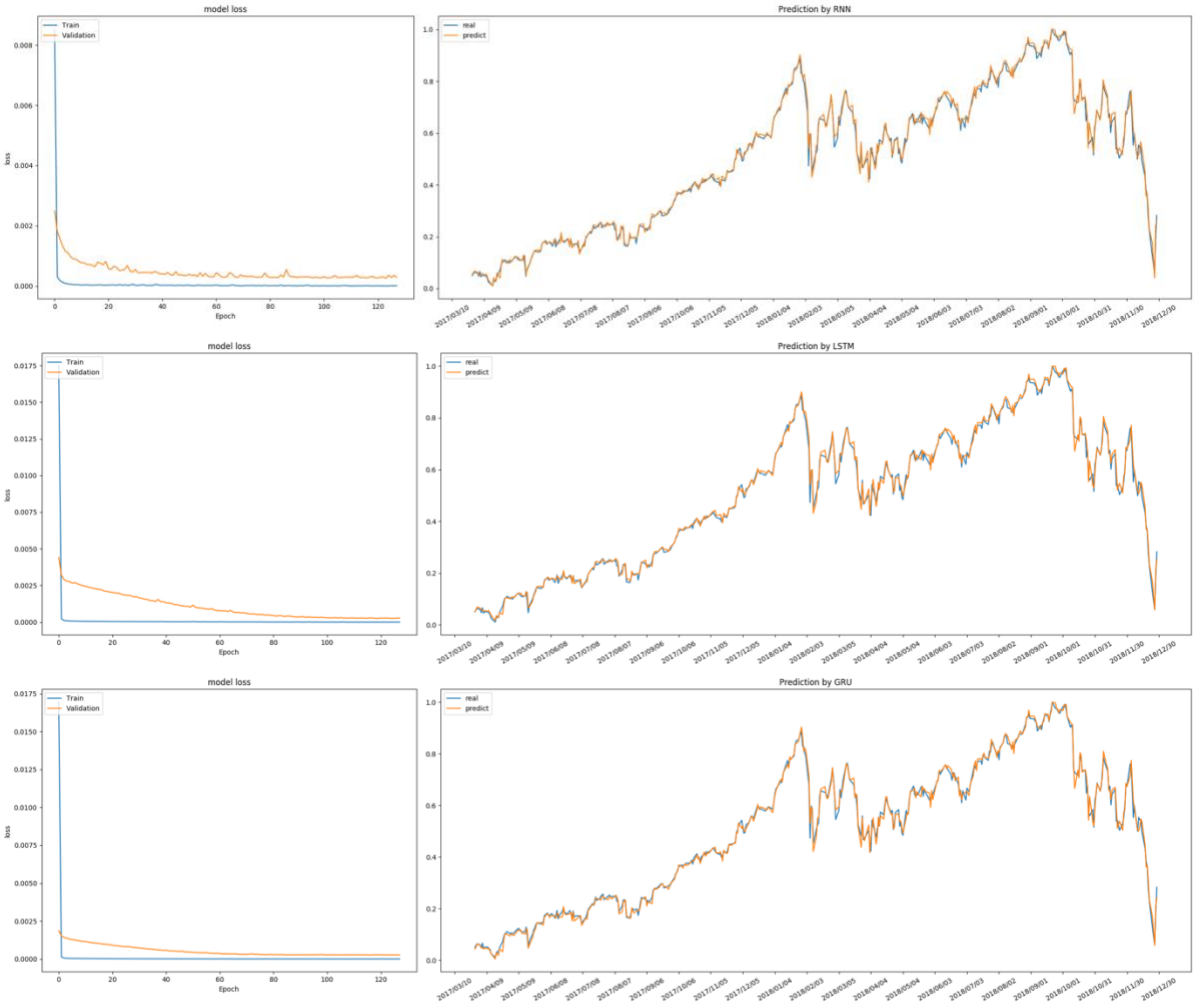
ii. I added only 4 features as the problem state. For each features, I generate it by using ‘talib’ which are moving average of 10 days, moving average of 30 days, K line and D line (technical indicators that show the threshold of overbought and oversold of stock)

iv/v/vi/vii/viii.

For all of the three model (RNN, LSTM, GRU), I designed the model with the same parameters which have

- one layer with 64 units
- use tanh as an activation function
- use Adam optimizer and mean squared error as a loss function
- 128 epochs
- 64 batches size

The reason I use the same set of parameters is for the sake of comparing the different between each model.



Loss value of RNN model is the most fluctuates among the three models and GRU has the least fluctuates. Loss value of each models after training have a slightly difference. The difference is that both RNN and LSTM have high loss value at the starting point than GRU.

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Execution time of each model:
RNN = 89.68285989761353
LSTM = 175.02727699279785
GRU = 165.83504581451416
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Since RNN doesn't has gate (the model is less complex) , the training time is faster than LSTM and GRU.