Project Summary

Problem Statement

Predicting stock movement is always in the investor's best interest. Back in the day, people relied on analysts and candlestick charts to read quantitive data to make a judgment, as we all know, not every expert can even come close to being accurate. Today, machine learning has advanced so much, deep learning and neural network are much more sophisticated than before, can we model something to predict the stock price base on the price itself?

Solution

This is an exploration project, by no means this is giving a one and only solution to the stock market, realistically speaking, the stock market is not accurately predictable with the price itself, it takes many more factors to possibly model it well. Nonetheless, this topic is a good exploration of the neural network modeling technique. We are going to compare 2 models side by side which are the simple RNN and LSTM models using Keras, which now is part of TensorFlow.

Data Source

The stock market data are downloaded from Yahoo Finance. Although, if this is a running application, it suggests having consistent automatic updates, like minimal delayed historical data API or even a real-time data streaming web socket API. But for this project, we will just focus on the neural network modeling itself. The data set will be downloaded from Yahoo Finance to .csv. 12 months daily, open high low close, the volume will be used.

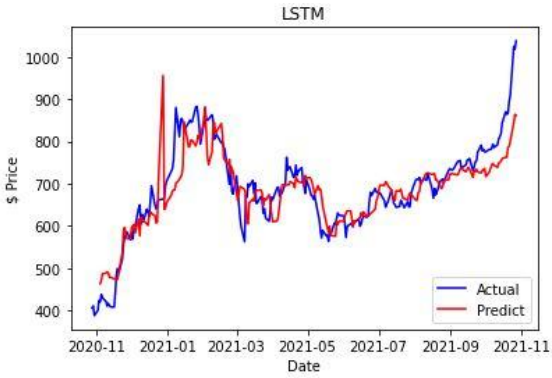
Programing Environment

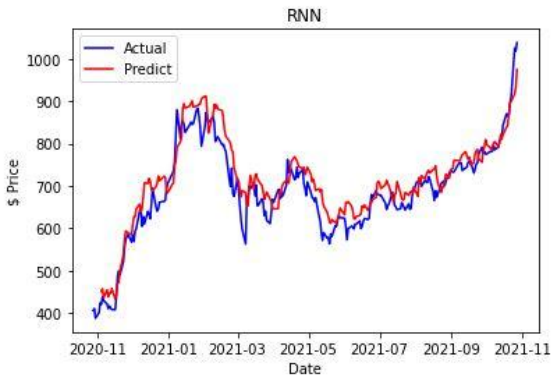
Window 10/11, Python 3.9, Jupyter Lab, Google Chrome

Libraries Used

Pandas, TensorFlow, Keras, Matplotlib

Result





Surprisingly, the simple Recurrent Neural Network actually performs better than Long Short Term Memory in this exploration project. I believe the reason, is because LSTM tends to overfit the data, causing the model to be overly sensitive. The simple RNN gives a more general solution to this problem, which ultimately gives better performance.

Project Link and Source Code

RNN & LTSM Modeling in IPYNB:

https://github.com/GiggleSamurai/Timeseries-Prediction-with-LTSTM-on-Financial-Market-Data/blob/f74ddd6813ec7d028fa64139cc2543a069cd4631/Main%20LTSM%20Project.ipynb

NOTICE: The URL links are **not** clickable from GitHub pdf rendering, please download the pdf to click on the links. You can also access the project from the directory folder of this document. Both data set and project are contained in this folder.

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Louis Wong