Stock Market Price Predicting with LSTM

By Kevin Sukher

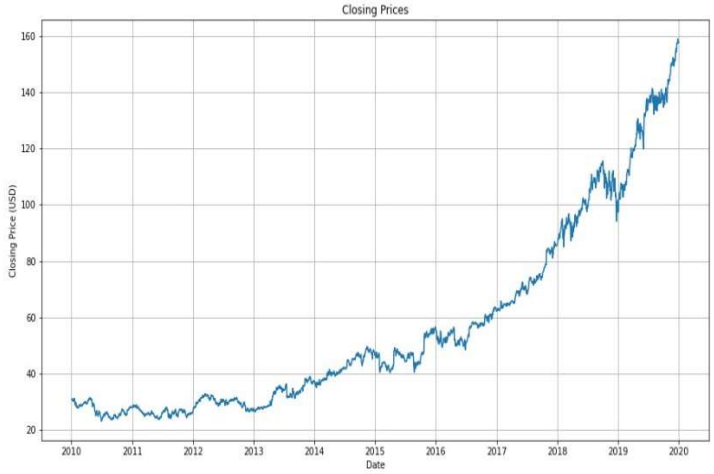
Purpose and Intentions

With the stock market being one of the most volatile systems in the world. Banks, analysts, investors and others have been trying different methods for decades to know, or at the very least, predict the future values of stocks to gain advantage in trading.

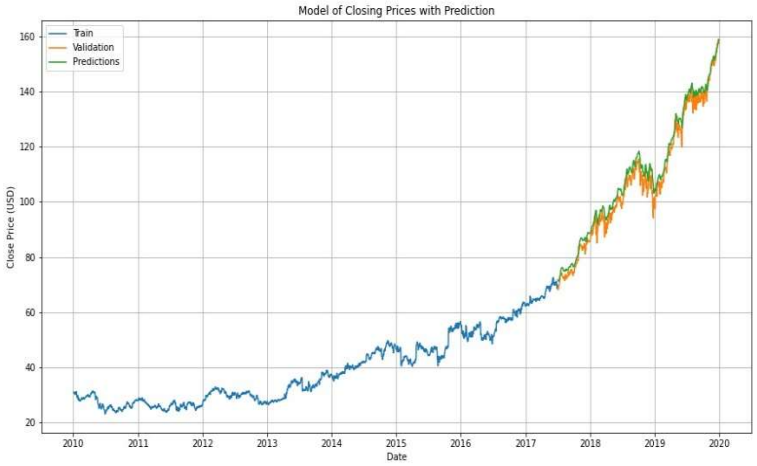
For this project, the objective is to create, train and test a machine learning recurrent neural network (RNN) algorithm to see if it can predict stock values and compare how well it performs to the actual data. The predicted outcome goal is to generate a predicted model based on this algorithm that will be similar to the original with a low margin of error.

Procedural Method

For the approach to be conducted in this project, the Long Short-Term Memory (LSTM) algorithm will be used to generate the model and will be compared to the original stock data. Stock data will be used and split into training and test sets that the model will use for training the neural network. The sets will run through the LSTM and results will be graphed, as well as, calculated for how accurate it was to the original and the margin of error for the prediction. After, comparing the predicted model to the original fit, a future value will be generated and compared for accuracy against the actual next day value of the stock.



A plot of the closing prices over a range of dates of the stock example used in this project.



A plot of the closing prices split into blue for training data and orange for validation data. Includes a green predicted partial graph that the model generated based on the LSTM algorithm and testing data that was ran through the system.

Conclusion and Results

For the outcome of this project, visually it can be seen that the LSTM prediction model looks very similar to the original after training and testing. On a calculation standpoint, looking at the root mean square error (RSME), the result value was 3.24. Compared to general RMSE values for these systems that is very low, meaning a very small margin of error for the model.

Looking at the prediction, for this stock market example the LSTM model predicted $158.75 for the future day price. The actual price however was $160.61, equating to a margin of error of 2% between the prediction and actual values.

Further Development

Even though the basic LSTM model that was created work effectively to an extent, there is always room for improvements to drop error margin and get a more accurate prediction. Some ways would be an increase of layers to the LSTM architecture, putting the model through more training and testing runs, optimizing the code or method of LSTM modeling for better efficiency and run time, and many others. Either way, models like these are never going to be perfect for something as volatile as the stock market but we will continue to push the margin of error as low as it can go.