

Machine Learning - Stock Analysis, Predictions, and Follow-up.

CS483 – Topics in Machine Learning

Analysis performed by: Team Deep Blue - Joshua Sweet, Henry Unruh

Synopsis

The synopsis of the project is to create code that analyzes various stocks within the stock market via machine learning methods established in class. Our team was tasked to select ten different stocks and predict the potential value after three weeks. This is the follow up report three weeks after our initial predictions.

Tools used

Python3 -- Jupyter Notebook

Analysis

Our team chose the following companies to perform our analysis: NVIDIA, Microsoft Corporation, Tesla Inc., CenturyLink Inc., Activision Blizzard Inc., Ford Motor Company, Roku Inc., AMC Entertainment Holdings Inc., McDonald's Corporation, and Comcast Corporation. We chose these companies as most of them are constantly changing and offering new innovations to technology, or in some cases (McDonald's, AMC) offering a view on common consumer interests (food and movies).

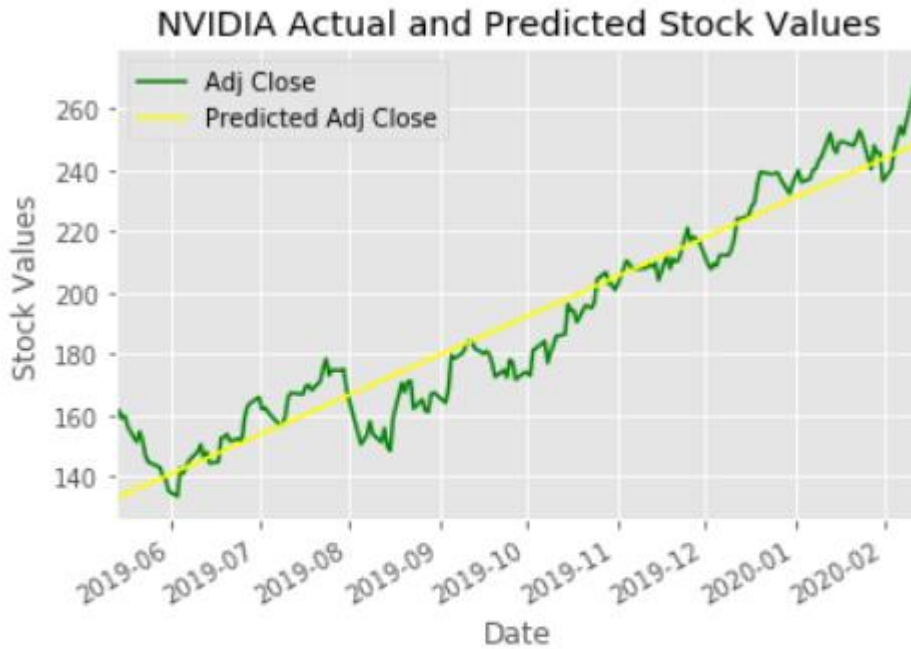
The historical timeframe that our team used was a monthly interval, spanning several months back to current time. This timeframe was chosen because a general trend can be established over a long period of time, whether the stocks will increase, decrease, or generally remain the same. Going back multiple months allows us to gather such data to make a somewhat accurate or informed decision based on this general trend.

The steps that we took in order to gather result was to pull information from a financial database. The database that we pulled stock information from was from Yahoo Finances, which was what the project document listed. Once we got the information, it was about the code trying to perform the analysis that we wanted. We designed the code to read in the data from our timespan, fit the data in a reasonable format, and from there, be able to produce a prediction of the next month, given the prior data. The method that we used in order to gather an estimate was linear regression, since it was a method that was discussed in class.

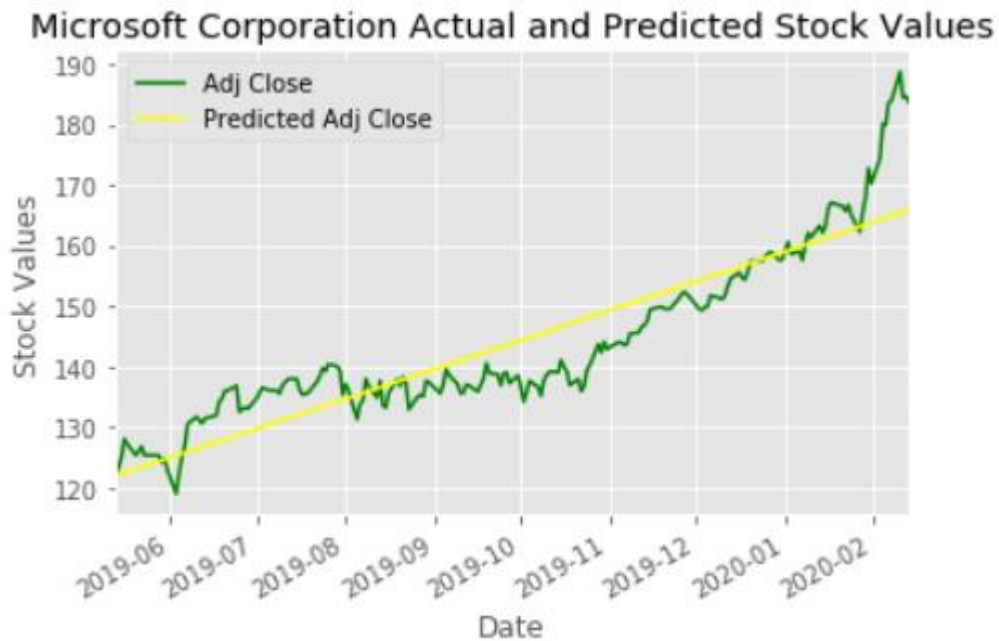
After three weeks, the actual stock values for all companies are: NVIDIA has a value of 266.04, Microsoft has a value of 161.57, Tesla has a value of 703.48, CenturyLink has a value of 11.97, Activision Blizzard has a value of 59.97, Ford Motor Company has a value of 6.49, Roku has a value of 102.00, AMC Entertainment Holdings holds a value of 4.53, McDonald's has a value of 198.86, and Comcast Corporation has a value of 40.37.

This is comparison to our predicted values: 258.38, 169.34, 555.76, 15.0, 62.83, 8.54, 153.53, 6.61, 204.53, and 45.76 for NVIDIA, Microsoft, Tesla, CenturyLink, Activision Blizzard, Ford Motor Company, Roku, AMC Entertainment, McDonalds, and Comcast respectively. These results are somewhat accurate, though the method of estimation used wouldn't be nearly as accurate as other methods. This is because linear regression represents the data as a line, not a graph that roughly fits the general shape of the stock data.

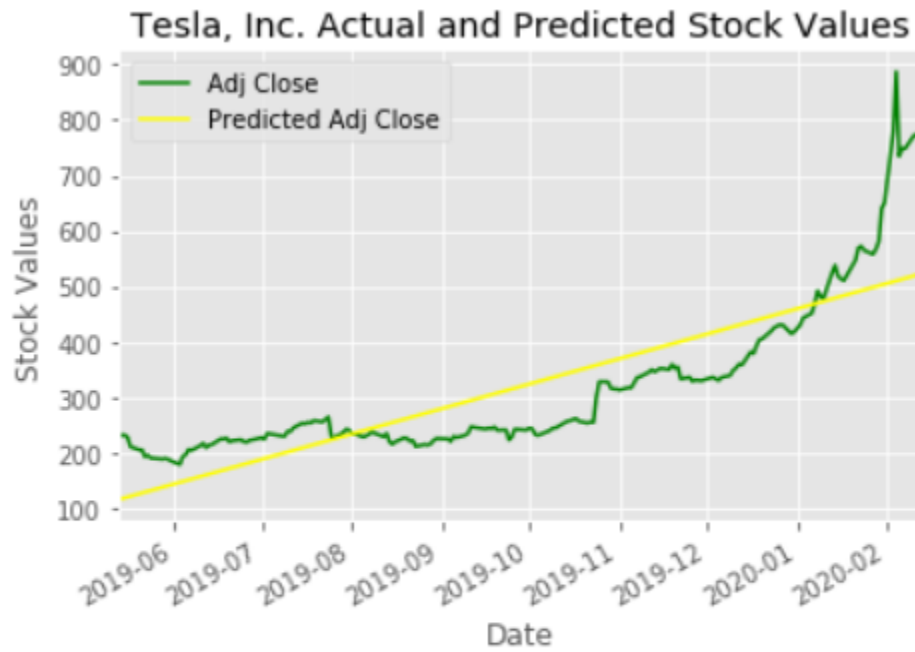
Here are our results:



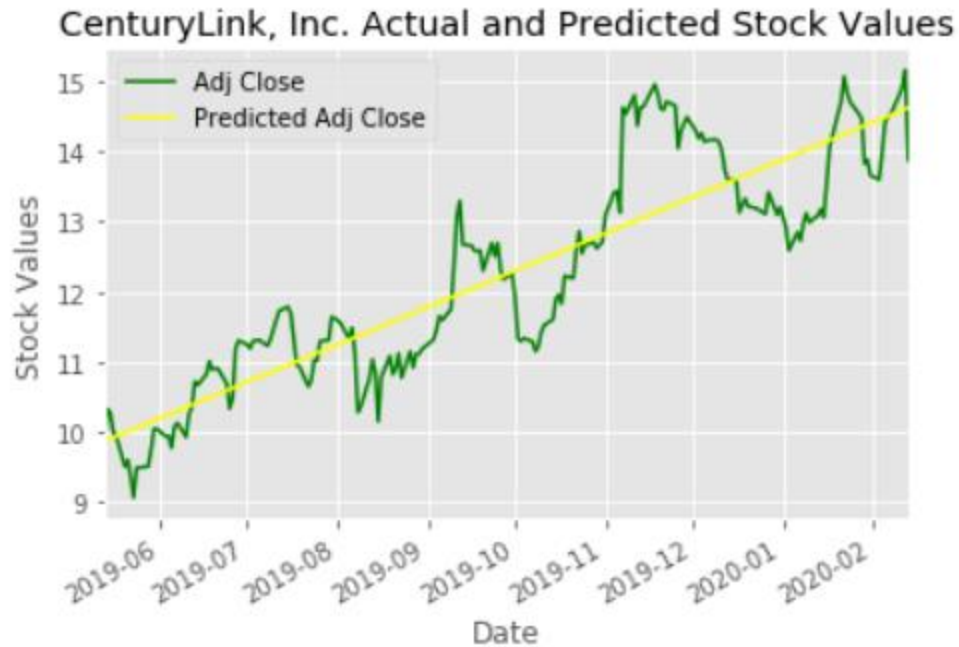
Predicted Adjusted Stock Value for NVIDIA on March 6th, 2020 to be 258.38



Predicted Adjusted Stock Value for Microsoft Corporation on March 6th, 2020 to be 169.34



Predicted Adjusted Stock Value for Tesla, Inc. on March 6th, 2020 to be 555.76

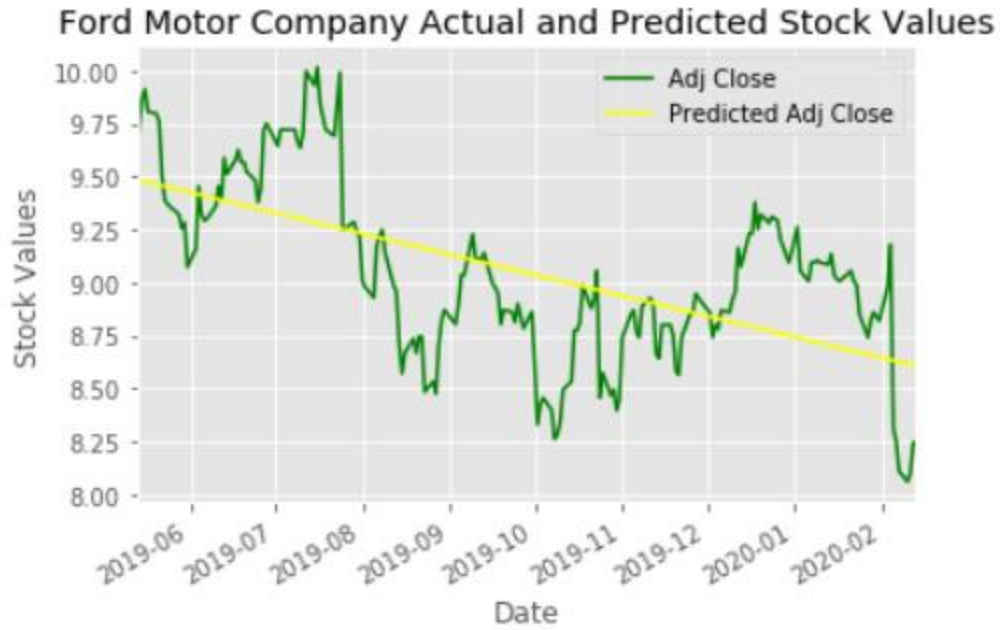


Predicted Adjusted Stock Value for CenturyLink, Inc. on March 6th, 2020 to be 15.0

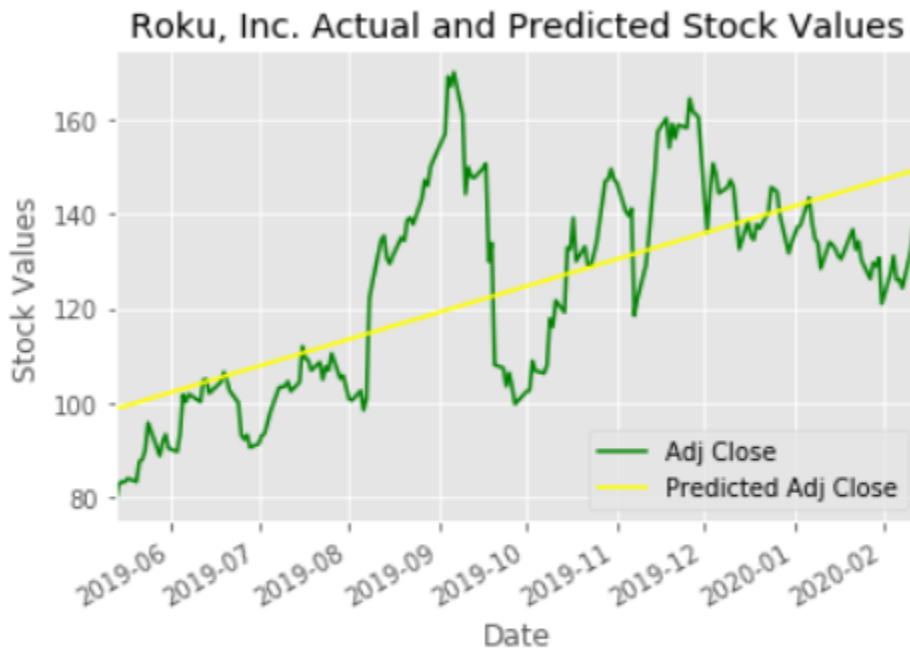
Activision Blizzard, Inc. Actual and Predicted Stock Values



Predicted Adjusted Stock Value for Activision Blizzard, Inc. on March 6th, 2020 to be 62.83



Predicted Adjusted Stock Value for Ford Motor Company on March 6th, 2020 to be 8.54



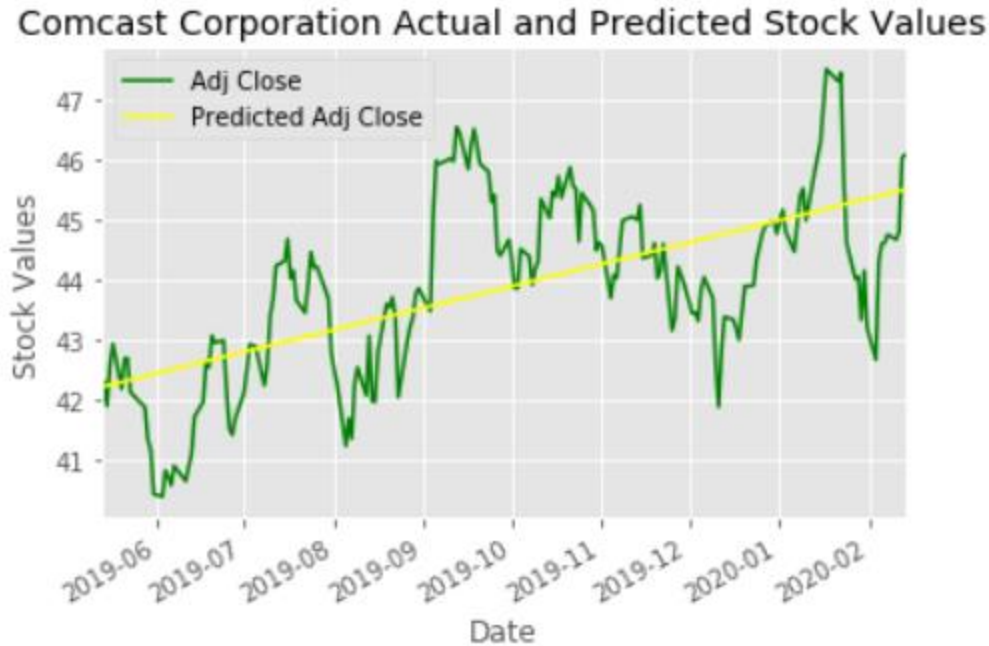
Predicted Adjusted Stock Value for Roku, Inc. on March 6th, 2020 to be 153.53

AMC Entertainment Holdings, Inc. Actual and Predicted Stock Values

Predicted Adjusted Stock Value for AMC Entertainment Holdings, Inc. on March 6th, 2020 to be 6.61



Predicted Adjusted Stock Value for McDonald's Corporation on March 6th, 2020 to be 204.53



Predicted Adjusted Stock Value for Comcast Corporation on March 6th, 2020 to be 45.76

Conclusion

Our estimations follow the trend of current stocks from these companies. The method of linear regression does present a trend-line that fits the data, but won't necessarily be too accurate as it doesn't fit closely or compensates for the overall shape of the graph.

After three weeks have passed, the predicted values that our team had gathered were rather close to the actual values. Linear regression is a simple and basic method that produces an effective trendline given enough data. It isn't nearly as accurate as other methods, but the projection that we created was adequate enough to give a general impression of the stocks at that time.

The members of Deep Blue were Joshua Sweet and Henry Unruh. Joshua helped create the majority of the python code to generate the graphs and trends. Henry was responsible for quality assurance, performing analysis from the code, and writing the report.