Deliverable 1

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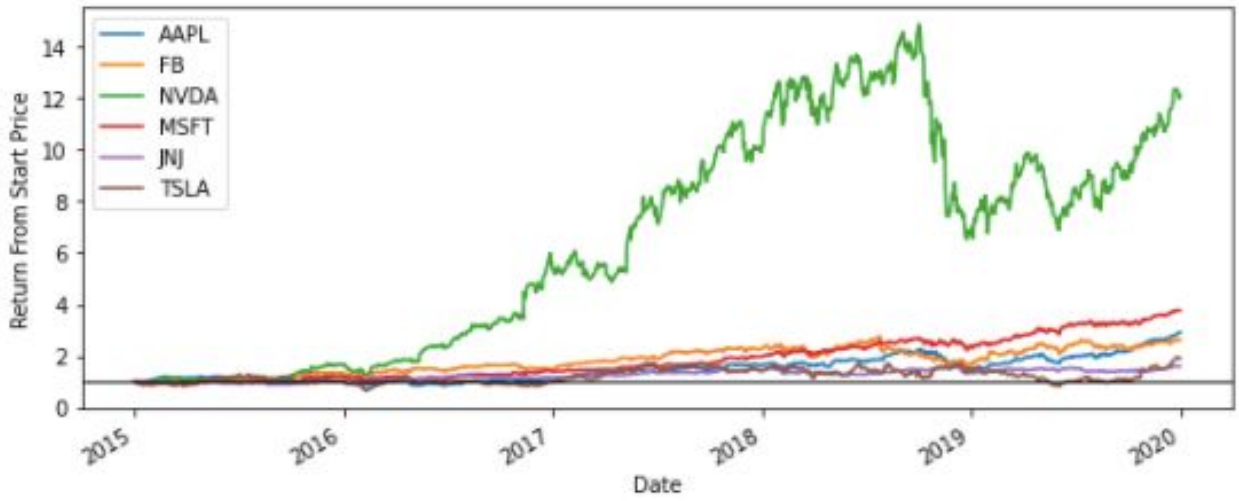
Data Collected

- We collected data using Quandl and Yahoo Finance. We chose Yahoo Finance and Quandl because each allows us to make frequent API requests, using an account API Key, and delivers the necessary data we need. Furthermore, Yahoo Finance are implemented with pandas datareader, as they work very well together, and Quandl data is implemented with a stocker class.
- So the data we collected for each of our stocks goes back 5 years, and in addition to that we are able to adjust the time frame to analyze a shorter or longer time period to recognize trends
- We gathered the last 5 years of data for each stock, this included the adjusted closing price, the volume traded, return from start price, daily percentage change of stock price, the 50 and 200 day moving averages, compared observed trends vs actual trends for each stock, and primitive implementation of predicting future stock prices



Date	High	Low	Open	Close	Volume	Adj Close
2020-01-10	163.220001	161.179993	162.820007	161.339996	20725900.0	160.066711
2020-01-13	163.309998	161.259995	161.759995	163.279999	21626500.0	161.991394
2020-01-14	163.600006	161.720001	163.389999	162.130005	23477400.0	160.850479
2020-01-15	163.940002	162.570007	162.619995	163.179993	21417900.0	161.892197
2020-01-16	166.240005	164.029999	164.350006	166.169998	23865400.0	164.858597
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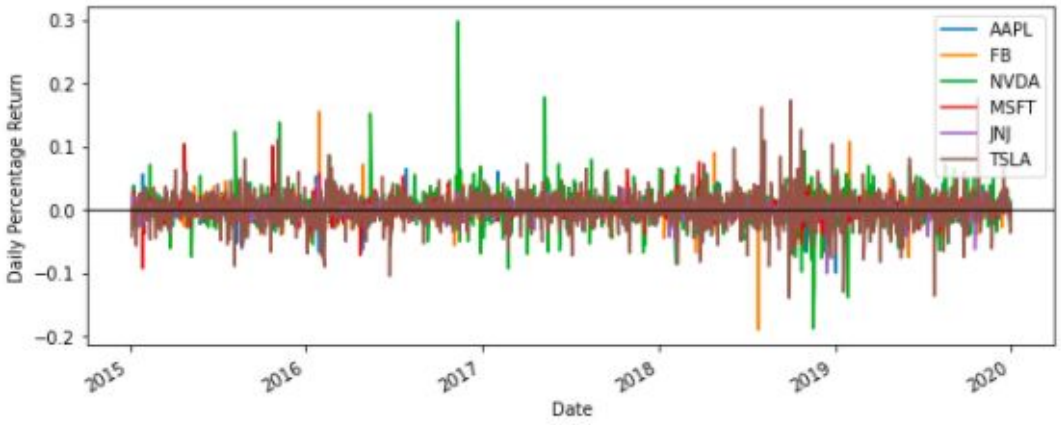
2020-10-14	224.220001	219.130005	223.000000	220.860001	23451700.0	220.860001
2020-10-15	220.360001	216.009995	217.100006	219.660004	22733100.0	219.660004
2020-10-16	222.289993	219.320007	220.149994	219.660004	26057900.0	219.660004
2020-10-19	222.300003	213.720001	220.419998	214.220001	27625800.0	214.220001
2020-10-20	217.369995	213.089996	215.800003	214.649994	22753500.0	214.649994

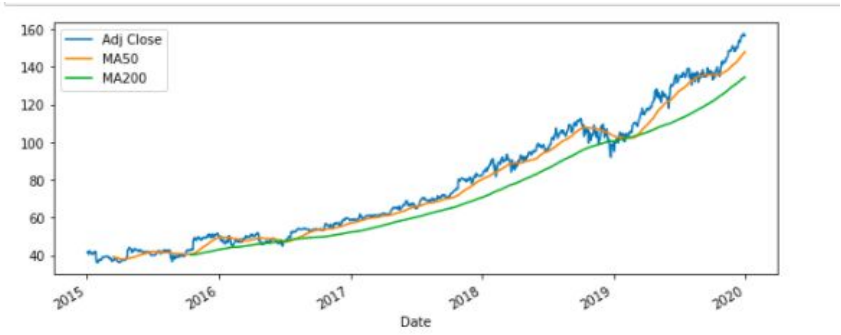
Metrics

- The metrics we chose to chart our stock data with allowed us to better visualize and understand the movement of a particular stock during the time period we selected and to deduce any trends

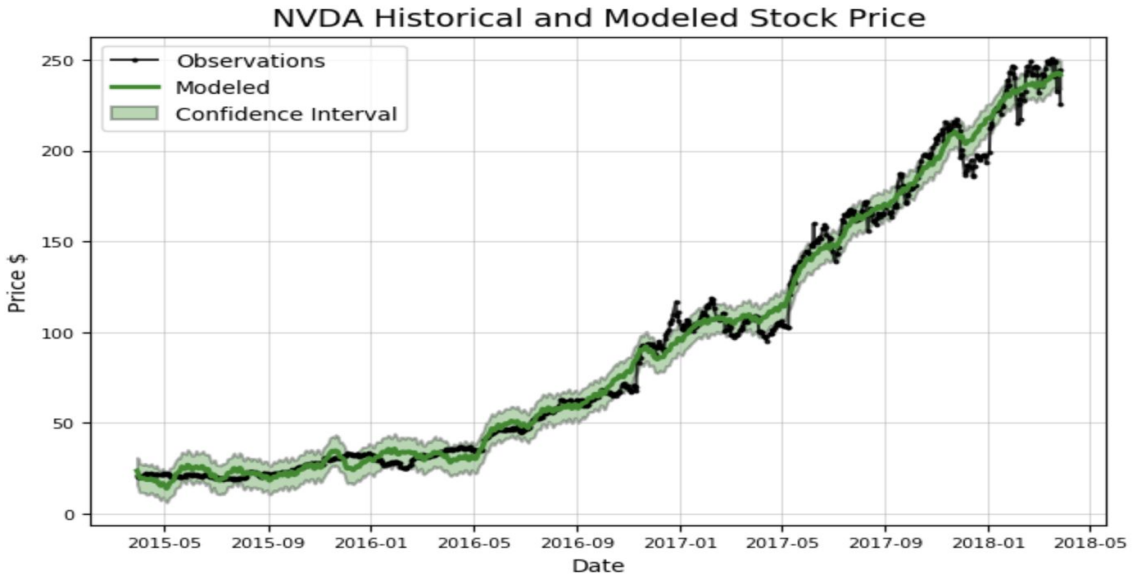


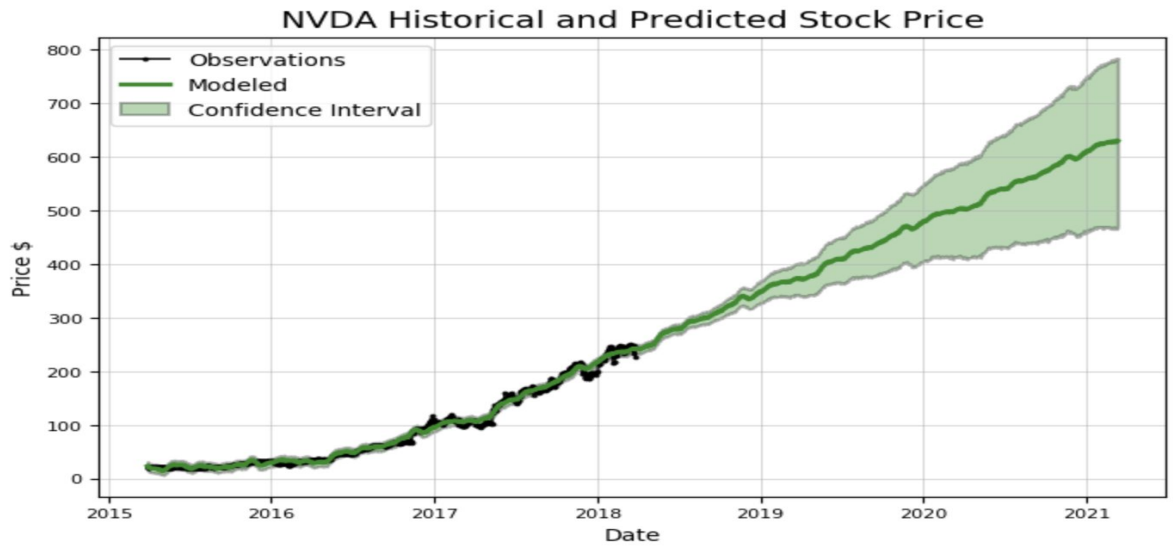
- Such as above where we charted the daily percentage change of each stock, and although it is a little hard to see with 6 stocks being shown (which can be adjusted to see one stock's behavior) it is clear that NVDA during 2017 was very volatile given the spikes being higher

- Another metric we tracked and charted was the 50 and 200 day moving averages of Microsoft and the other stocks, moving averages is calculated by taking the mean or average of the past data points of the prices, it can be used as predictive tool to anticipate the future direction and trend of a stock



- Another metric we tracked was, with the help with the Prophet library, the actual observed growth vs modeled growth for each stock. Furthermore, we also used the Prophet library to predict each stock's value in the future(Note: this might not be a great implementation as we are just testing the functionality of the method. We will do more testing in the following week to conclude the validity of the method in the library). Below is an example of one of the stocks:





Next Steps

- Since we have a better understanding of the libraries and frameworks we are using, we plan on getting a little more nuisance in our data collection and analyzing to facilitate making simulated trades based on trends we anticipate
- As we try to answer one of our questions, is the history of stock prices an indicator for future stock prices/movement?
    - From what we gathered so far our answer is yes based on our backtesting of historical data and first shot at predictive analysis with moving averages
    - But as we continue we want to experiment with one or two more ways to better forecast the direction of a stock (i.e Moving Average Convergence Divergence, Exponential Moving Average, Relative Strength Index)
    - Incorporate data from Finviz to acquire metrics about p/e ratio and other quantitative data to assist in our prediction (bullish or bearish)
- We are also going to start to make weekly simulated plays (long and short term) to test our predictions and begin to answer more of our questions