

Stock News Prediction

By: Vincent Welsh

Outline

- Business Definition
- Data
- Methodology
- Results
- Conclusions
 - For a live dashboard an XGBOOST model is the best fit for implementation.
 - Add news sentiment to stock predictions.
 - Insider trading can be an indicator of a mass selloff event.
- Further Work
- Questions

Business Definition

- Business Problem:
 - Stock prices are a a very important metric because they represent the value of publicly traded companies in the eyes of society.
 - There is also a strong financial incentive to have a higher stock value for current shareholders because stocks can be liquidated into currency.
 - Stock prices fluctuate based on the supply and demand of stocks associated with a particular company.

Business Value

- Increased confidence of return when investing in a company's stock
- Increase the confidence of current shareholders regarding stock's direction which can influence their decision to buy/sell your stock
- Determine key metrics that drive a stock price up or down
- Forecasting stock crashes will lead to the minimization of capital loss

Data

- The data for this dataset comes from <https://fmpcloud.io/>
- The data included in the dashboard are
 - Annual Revenue
 - Earnings Per Share
 - Insider Trades
 - Recent News
 - Stock Price Over Time
 - Recent News + Sentiment Scores

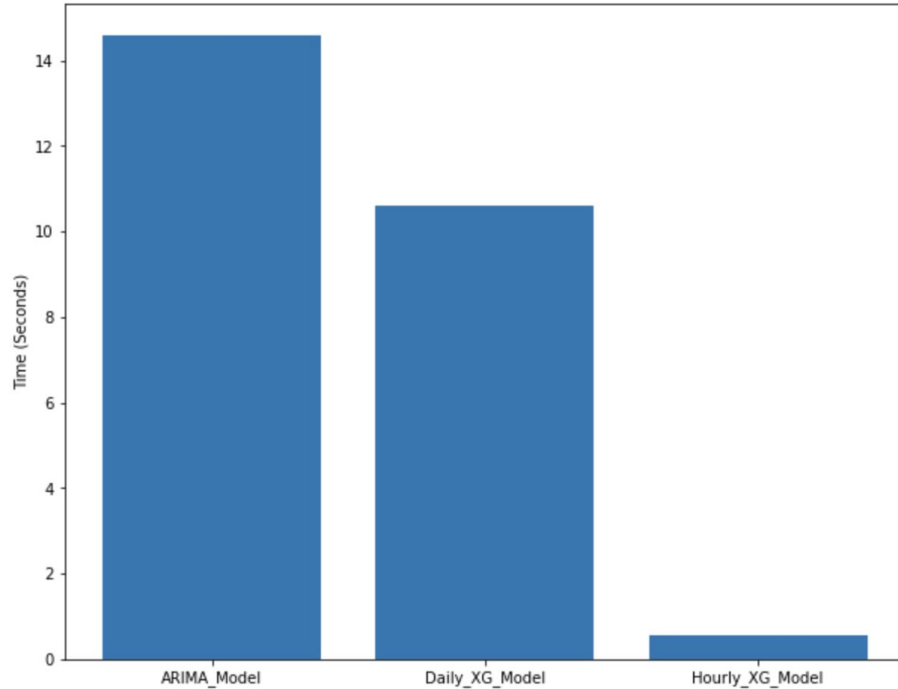
Methodology

- General Model Daily Prediction
 - XGBOOST
 - Contains 3 day previous values for:
 - High Price
 - Close Price
 - Change Over Time Decimal
 - Volume
 - Previous day news sentiment

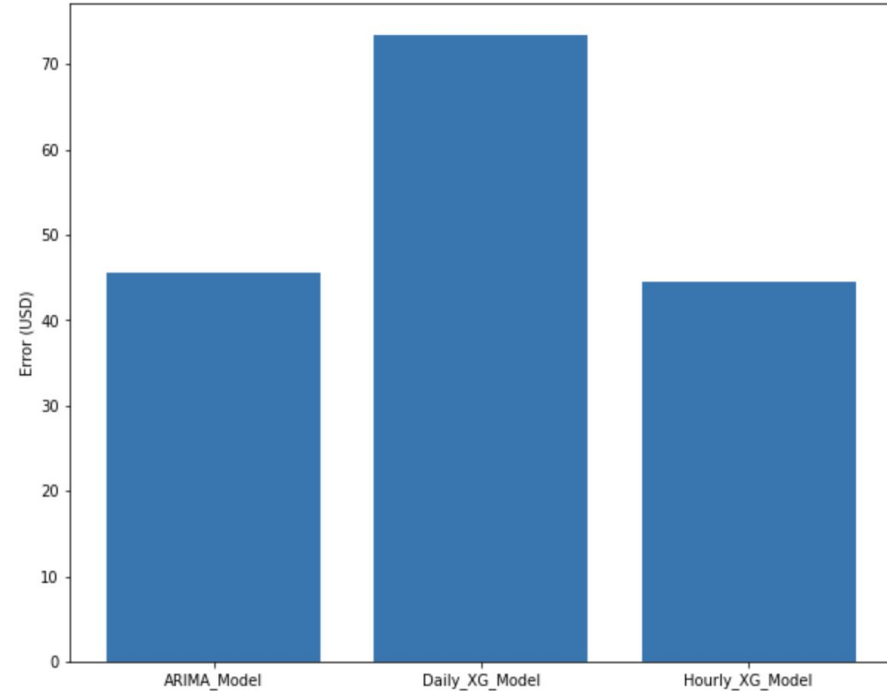
- General Model Hourly Prediction
 - XGBOOST
 - Contains 3 hourly previous values for:
 - High Price
 - Close Price
 - Volume
 - Low Price

Results: Model Comparison

Times of Stock Prediction Models



Mean Absolute Error of Stock Prediction Models : AMZN




Stock Dashboard Insider Trades

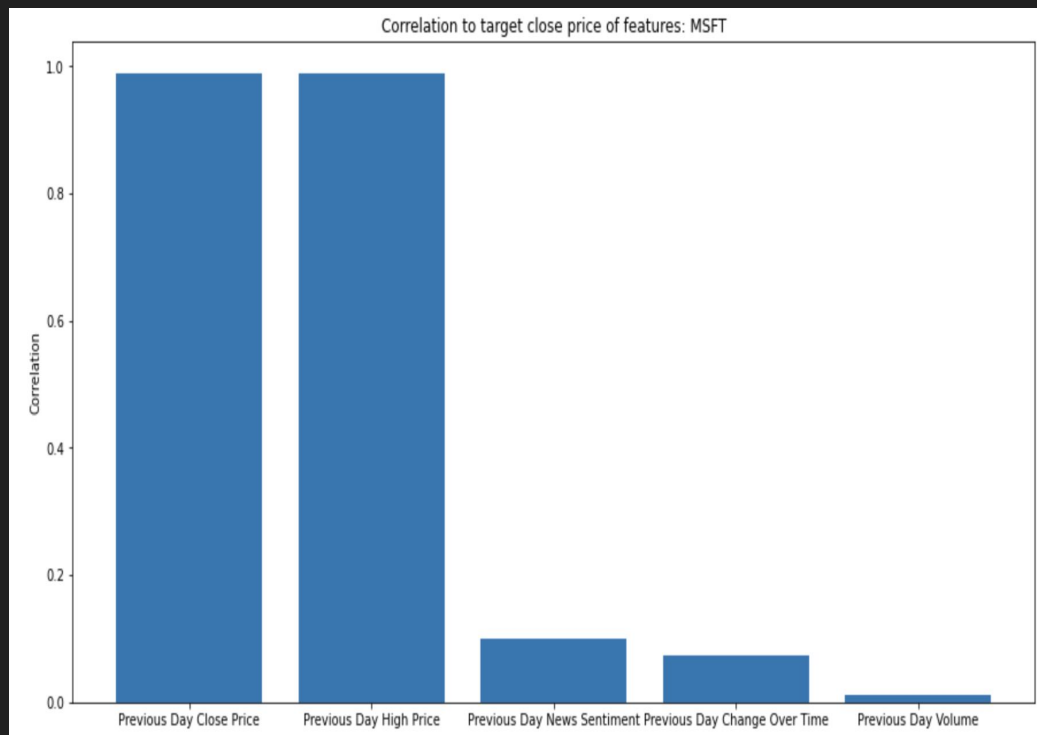
2021-11-05 21:22:24	2021-11-05	Sale	172250	Musk Kimbal	director	25000	74.17	Non-Qualified Stock Option (right to buy)
2021-11-05 21:22:24	2021-11-05	Sale	511240	Musk Kimbal	director	500	1236.623	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	511740	Musk Kimbal	director	2460	1235.105	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	514200	Musk Kimbal	director	9810	1234.322	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	524010	Musk Kimbal	director	10455	1233.082	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	534465	Musk Kimbal	director	850	1232.449	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	535315	Musk Kimbal	director	600	1230.939	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	535915	Musk Kimbal	director	14257	1229.677	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	550172	Musk Kimbal	director	9334	1229.146	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	559506	Musk Kimbal	director	1301	1227.352	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	560807	Musk Kimbal	director	21051	1226.553	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	581858	Musk Kimbal	director	11302	1225.789	Common Stock
2021-11-05 21:22:24	2021-11-05	Sale	593160	Musk Kimbal	director	1664	1224.959	Common Stock



Stock Dashboard News

2021-11-06 17:38:07	Elon Musk asks Twitter followers if he should sell 10% of Tesla stock	Elon Musk on Saturday asked his 62.5 million followers on Twitter if he should sell 10% of his Tesla stock.	The Guardian
2021-11-06 16:36:37	Tesla CEO Elon Musk Proposes Selling 10% Of His Company Stock, He's Asking Twitter Followers To Decide	Elon Musk on Saturday sent a tweet in which he proposed selling 10% of his Tesla Inc (NASDAQ: TSLA) stock, and asked his followers to vote on his decision. What Happened: The Tesla CEO was referencing a proposal in the U.S. Senate to tax the richest Americans in an effort to pay for social safety net and climate change policies.	Benzinga
2021-11-06 16:18:01	Elon Musk is using a Twitter poll to determine the future of 10% of his Tesla shares	Responding to criticism that he's avoided paying his fair share of taxes, the Tesla CEO said users could decide whether or not to hold or sell 10% of his stock.	CNBC
2021-11-06 16:06:36	Elon Musk proposes selling 10% of his Tesla stock in a Twitter poll	In the Twitter poll, Tesla CEO Elon Musk promised to "abide by the results of this poll, whichever way it goes."	Business Insider
2021-11-06 15:43:00	Musk asks followers on Twitter whether he should sell 10% of his Tesla stock	Elon Musk on Saturday asked his followers in a poll on Twitter if he should sell 10% of his Tesla stock.	Reuters
2021-11-06 08:00:00	How to Buy Tesla for the Cost of a Penny Stock	Ready to invest in Tesla for as little as \$1? Here's how.	The Motley Fool
2021-11-06 06:00:00	IONIQ 5 Review: Does Hyundai Have What It Takes To Challenge Tesla?	The IONIQ 5 represents a new era of quality and innovation for Hyundai's electric cars. But is it really the Tesla challenger some are claiming?	Forbes
2021-11-05 15:31:58	5 Stocks Set to 10x Next Year	Finding stocks that can go 10x next year is different from finding stocks that will go 10x in the next decade. Know what to look for!	InvestorPlace
2021-11-05 15:25:46	The options volume is chasing the big moves in stocks, says Susquehanna's Chris Murphy	Chris Murphy, Susquehanna co-head of derivative strategy, joins 'Power Lunch' to discuss how much the options market is affecting the overall stock market. Murphy looks at a couple of stocks which have seen big, recent moves and how option trading are affecting their prices.	CNBC Television 

Results: News Sentiment



	importance	feature_name
0	0.472796	Close_1day
1	0.293361	Close_3day
2	0.148589	Close_2day
3	0.049592	High_1day
4	0.012810	High_2day
5	0.004726	Cot_3day
6	0.004395	High_3day
7	0.003072	Vol_3day
8	0.002869	Cot_1day
9	0.002842	Vol_1day
10	0.001985	Vol_2day
11	0.001796	News_Sentiment_1day
12	0.001170	Cot_2day

Conclusions

- For a live dashboard an XGBOOST model is the best fit for implementation.
 - Faster than ARIMA/NN
- Add news sentiment to stock predictions.
- Insider trades can be predictors of mass sell off events.

Further Work

- Provide with more time, I would :
- Investigate if/how insider training affects model performance
- Implement analyst ratings to the prediction model
- Investigate actively raising stocks to determine causers of such movement

Questions?

About the author: Strongly self-motivated data science professional with 3 years of programming experience. Recent graduate of a full time data science bootcamp and professional experience as a language analyst for 3 years. Passionate about data, STEM, business intelligence and am eager to learn and grow.

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