Stock Price Prediction with Sentiment Analysis

• • •

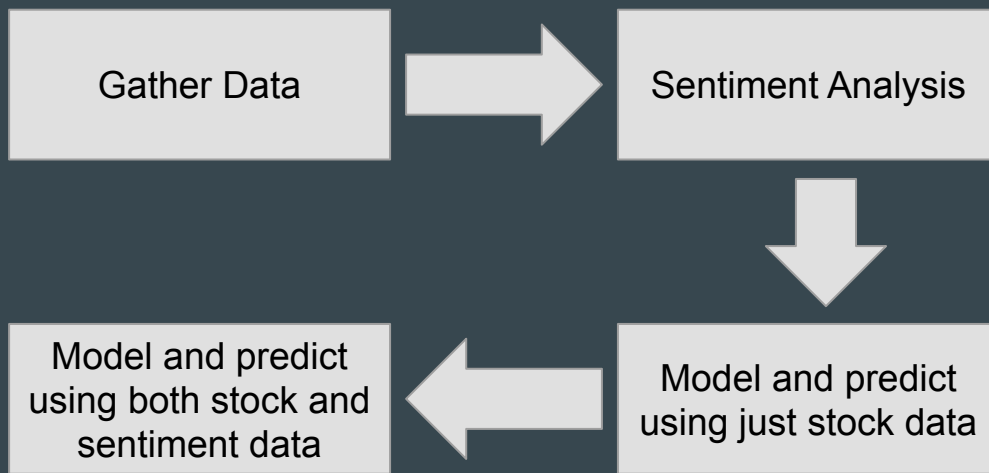By: Steven Kyle

Project Overview

Can stock prices be better predicted when incorporating sentiment data on social media.

Social Media:
 - Reddit
 - Twitter

Stock ticker in question:
 - ROKU

```
Gather Data  →  Sentiment Analysis
                      ↓
Model and predict  ←  Model and predict
using both stock and  using just stock data
sentiment data
```

General info about ROKU

- IPO was on September 28, 2017
- Started at $15.78
- Current Price $423.58
- 2,684% Gain
- $1,000 initial investment would now be $26,840

Data Gathered:
- Using the price since IPO to 05/28/21

Roku Closing Price

Gathering Sentiment Data

The top 5 posts on Reddit and Twitter where gathered for each business day.

Criteria to remove bot posts:
 - Twitter posts: Number of likes > 10
 - Reddit posts: Post score > 10

Data Gathered:
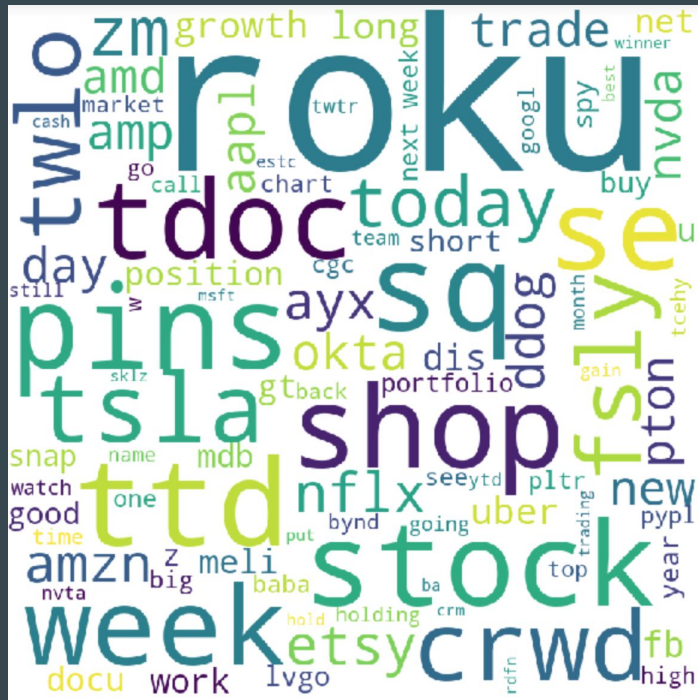 - Twitter posts = 565
 - Reddit posts = 618
 - Total posts = 1183
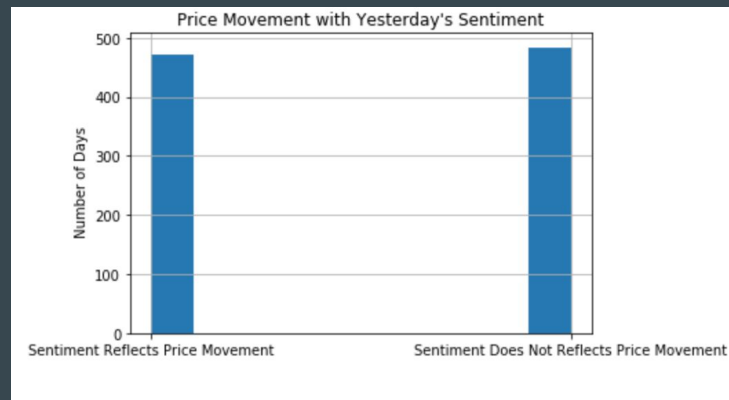
EDA on sentiment analysis

Reddit Word Cloud

Twitter Word Cloud

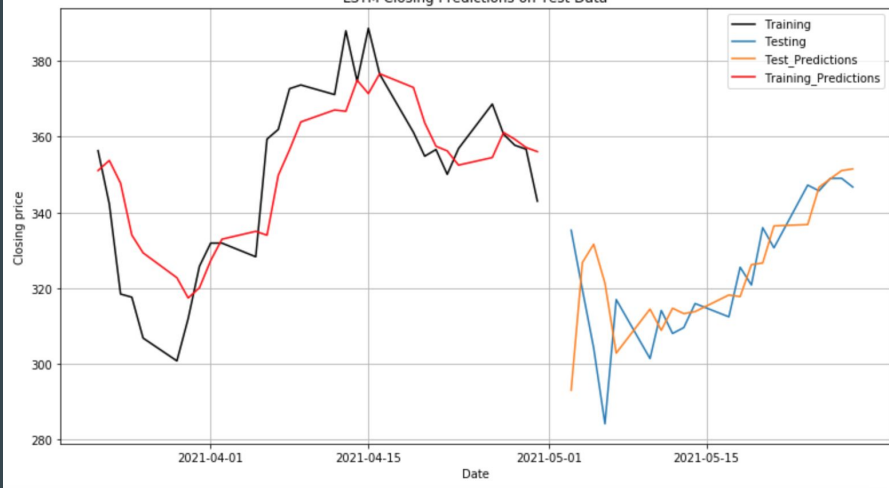# Trend between stock price and sentiment data

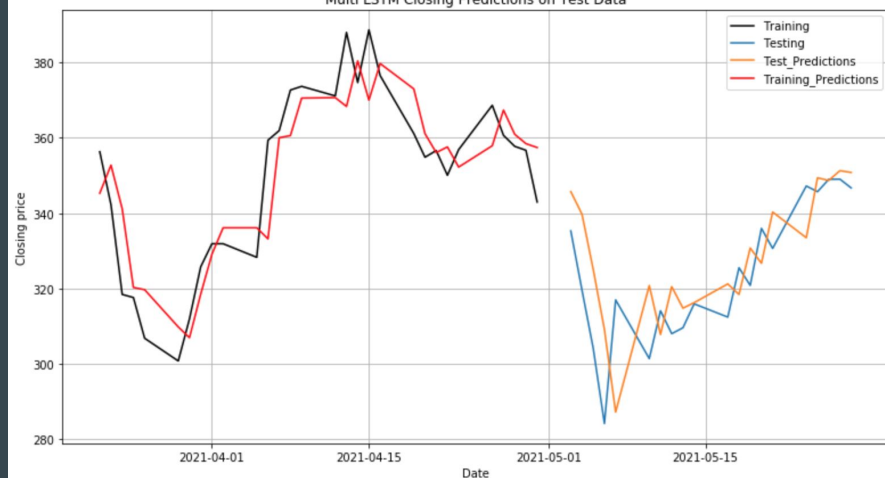There seems to be no correlation between sentiment data and price change for ROKU.

Date	Close_Price	Previous_Day_Sentiment	Previous_Day_Sentiment_Pos/Neg	Price_Change	Comparison
2017-09-29	26.540001	0.185700	POS	POS	Sentiment Reflects Price Movement
2017-10-02	23.559999	0.457833	POS	NEG	Sentiment Does Not Reflects Price Movement
2017-10-03	20.809999	-0.094050	NEG	NEG	Sentiment Reflects Price Movement
2017-10-04	20.850000	-0.066467	NEG	POS	Sentiment Does Not Reflects Price Movement
2017-10-05	22.010000	-0.038883	NEG	POS	Sentiment Does Not Reflects Price Movement

Modeling and predictions

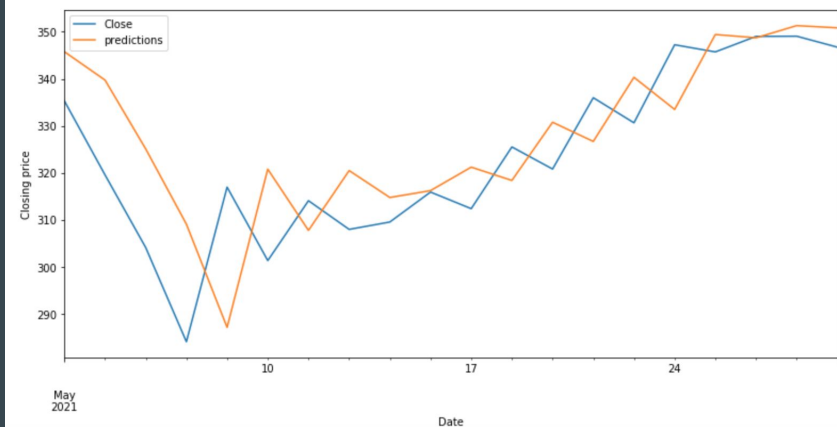# Modeling and Predictions Close Up
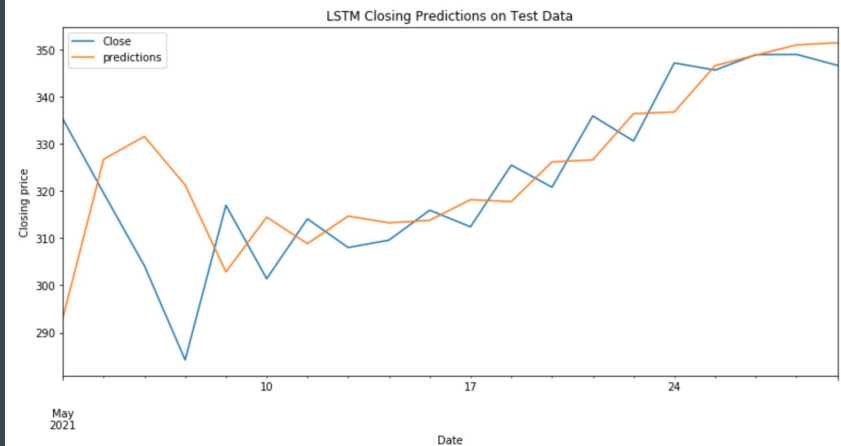
Summary and Future Direction

In the beginning there seemed to be no apparent correlation between stock price and sentiment. However, the model was able to bring the Test RMSE down from 15.506 to 13.585 when incorporating sentiment analysis data. The model using the sentiment and stock data was also able to follow the training data more closely.

Future Direction:
 - Make a more robust way of scoring sentiment data
 - Gather more sentiment data from other sources of social media
 - Make a dashboard that will report tomorrows predicted closing price

Recommendations:
Sentiment data did help predict next day stock price more accurately. Even though it was only a slight improvement I recommend trying to incorporate it in any Stock Data Anaylsis.

Acknowledgments and Contact

Thank you!
 - Yish
 - Amber Yandow
 - Eduardo Osorio

Contact Info:
Email: stevenkyle2013@gmail.com
LinkedIn: https://www.linkedin.com/in/steven-kyle-b3b771158/