{something about Tesla}

TESLA
Buy or Sell?

- Since 2013 price of Tesla stock (TSLA) has increased from less than $35 to a high of $389 in 2017

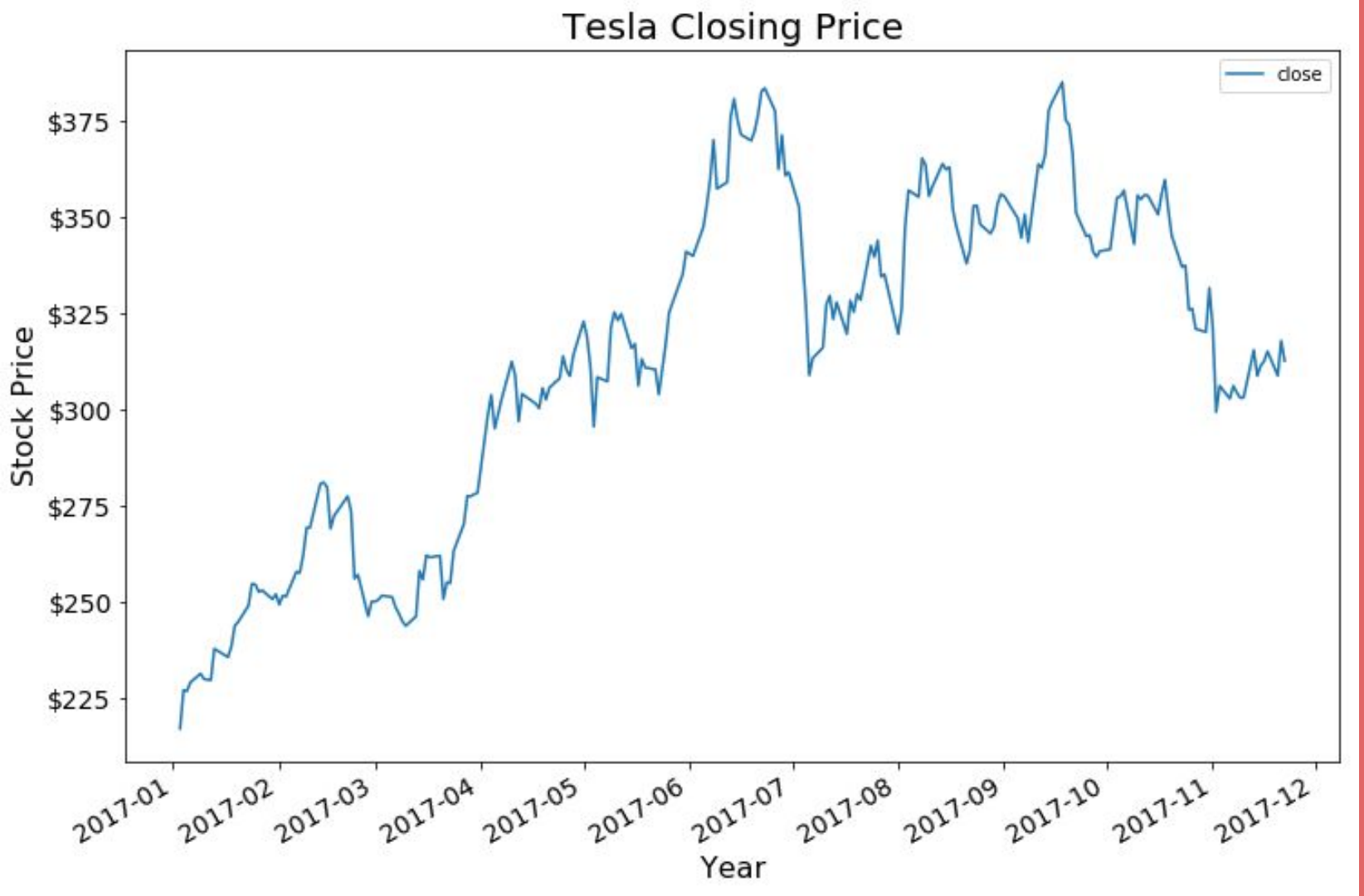
- January 2017, I purchased 3 shares for $216.51 which has grown over 50%

TESLA

- Not profitable (no annual profits)
  - 1 quarterly profit in 2013, 1 more in 2016

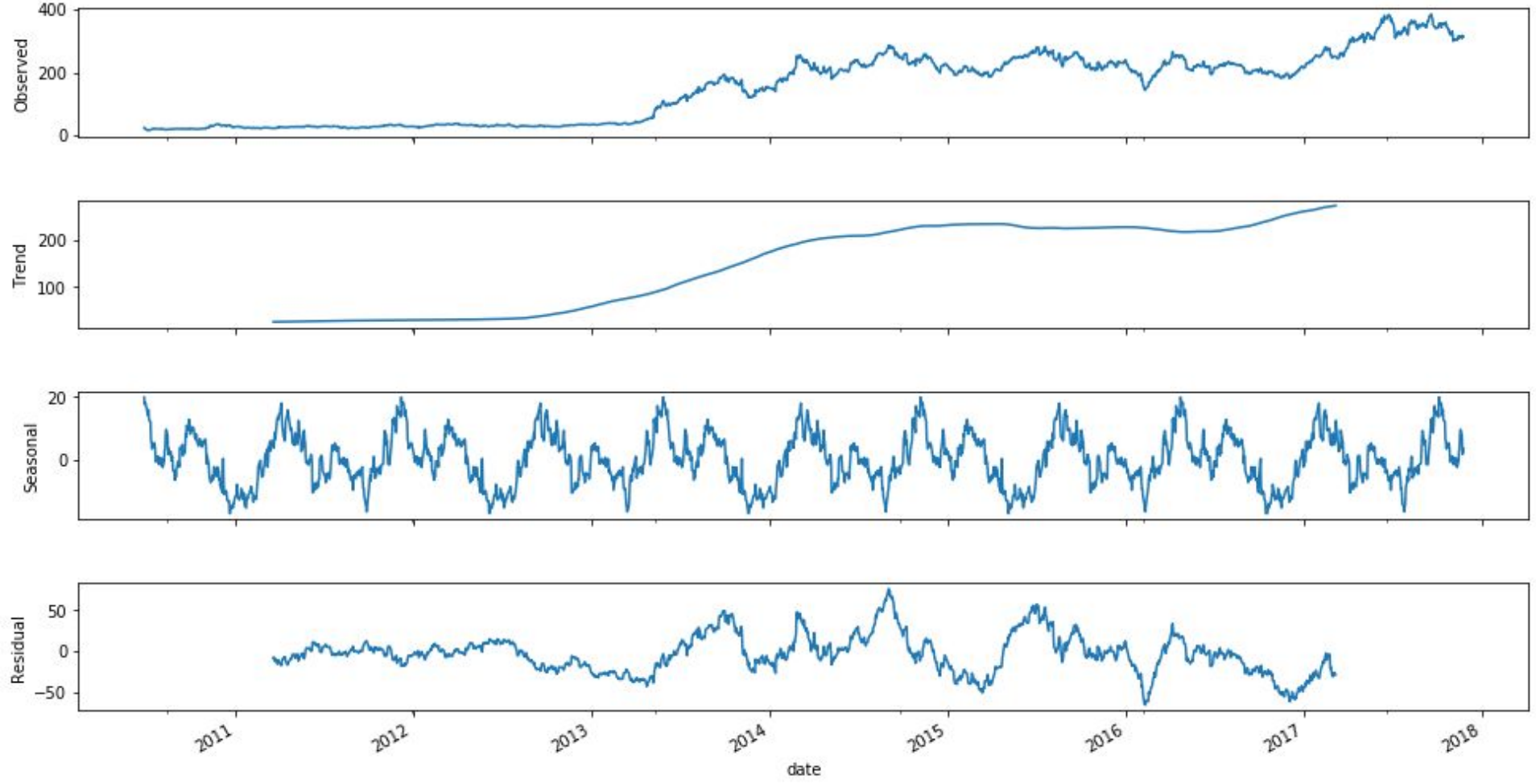
- Products
  - Electric Cars
  - Batteries (and charging stations)
  - Autopilot (for cars)
  - Solar City (solar powered roof tiles)

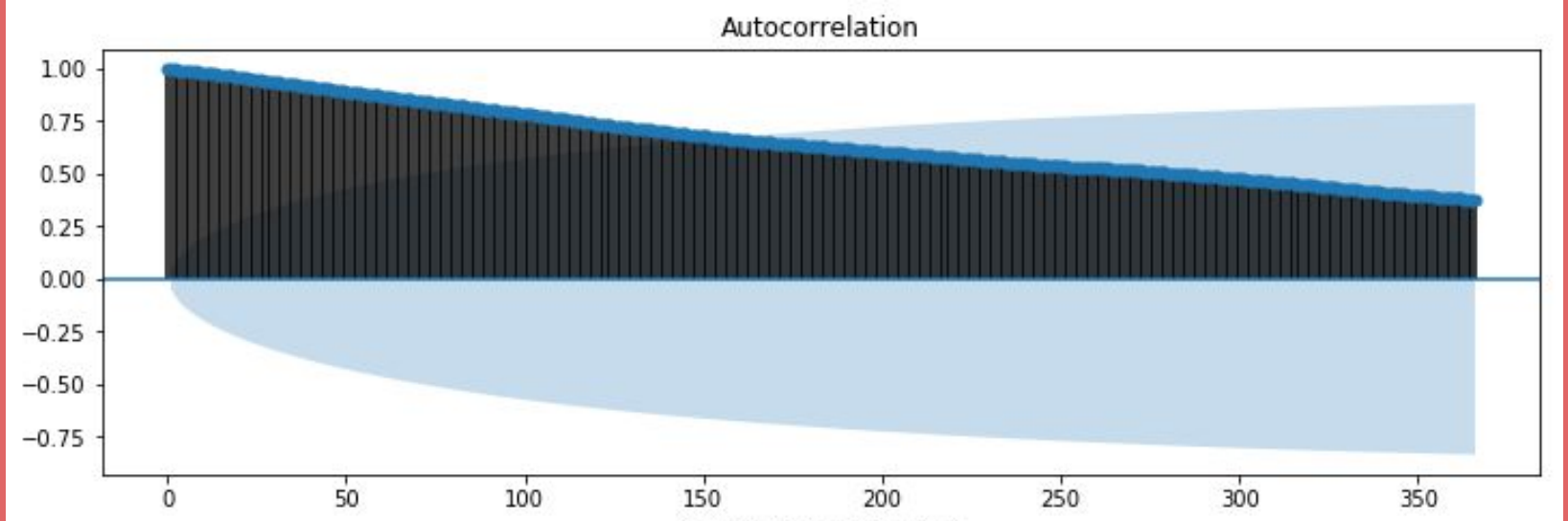
Tesla Closing Price
close
dale_bucks
$400
$350
$300
$250
$200
$150
$100
$50
$0
Stock Price
2011
2012
2013
2014
2015
2016
2017
2018
Year

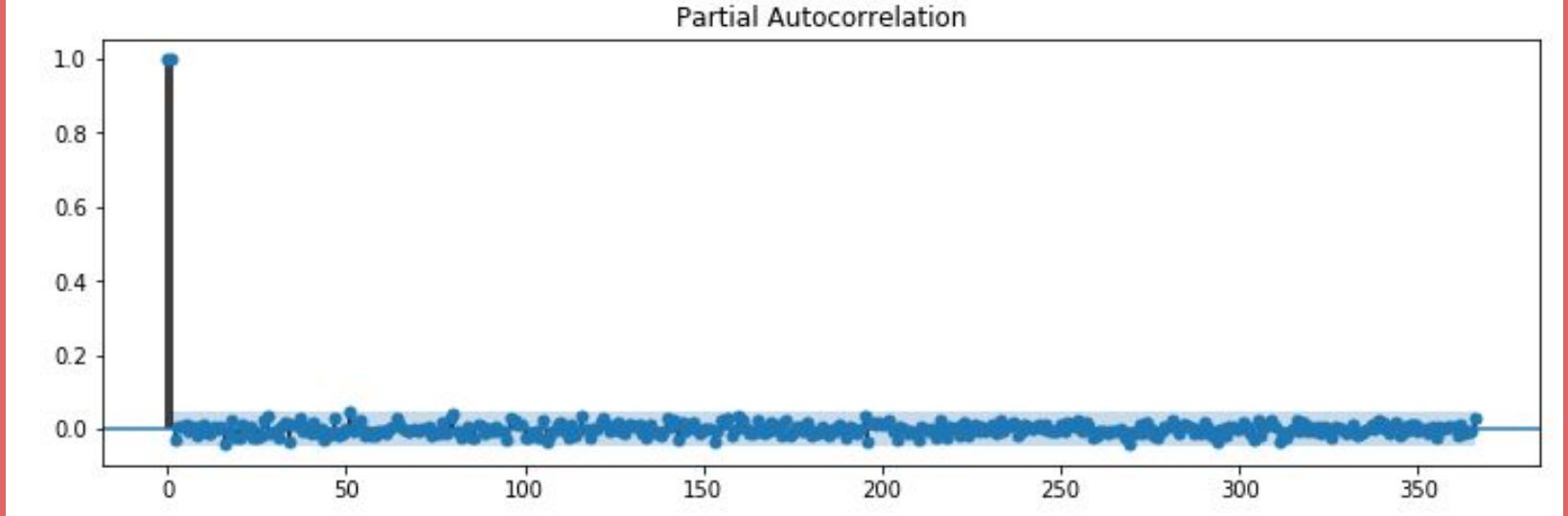

Tesla Closing Price
close
$375
$350
$325
$300
$275
$250
$225
Stock Price
2017-01
2017-02
2017-03
2017-04
2017-05
2017-06
2017-07
2017-08
2017-09
2017-10
2017-11
2017-12
Year

Solving problems with math: TIME SERIES

Deconstruction with Seasonality of one year

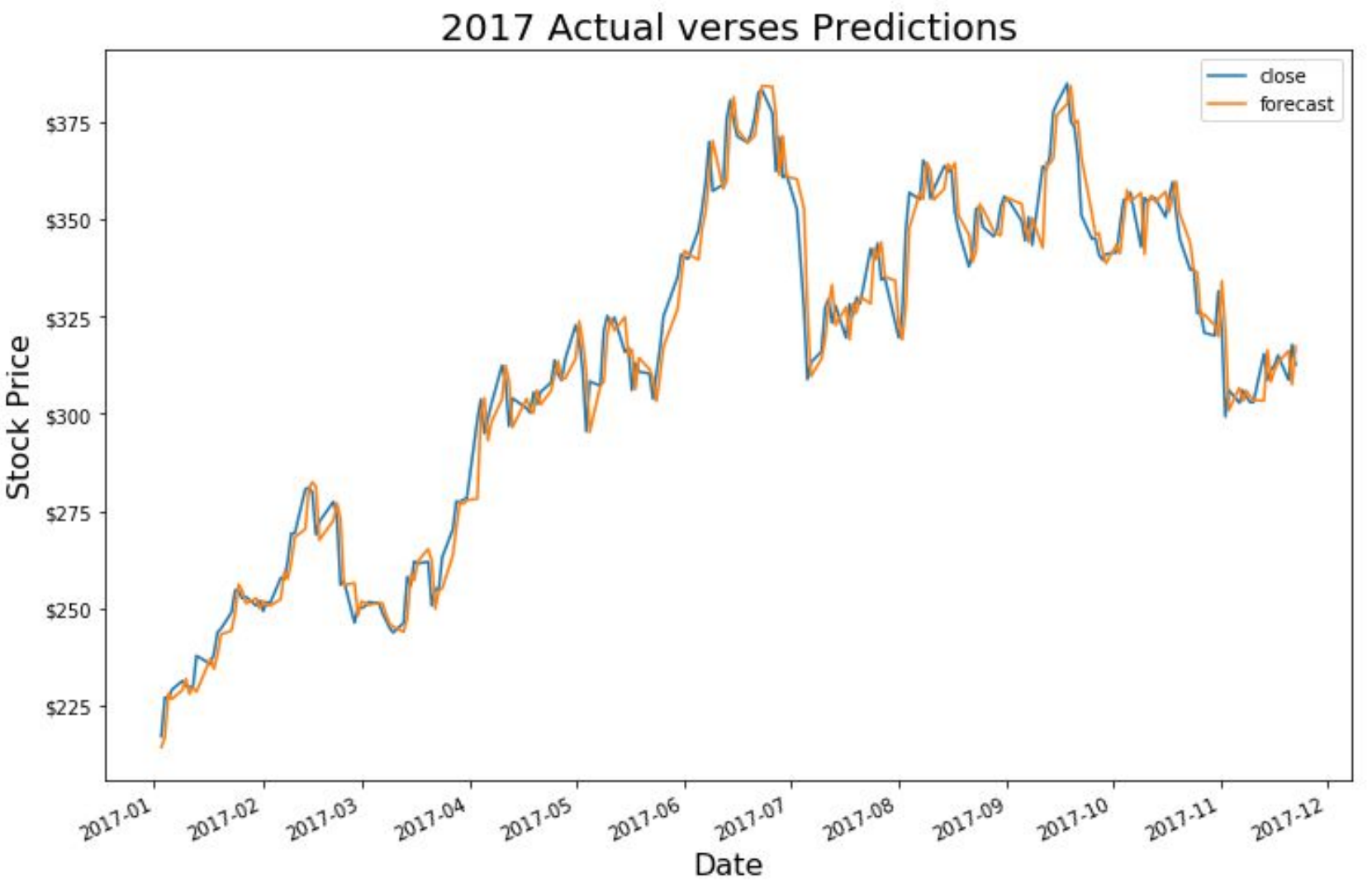



Autocorrelation
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
0
50
100
150
200
250
300
350


Partial Autocorrelation
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
250
300
350

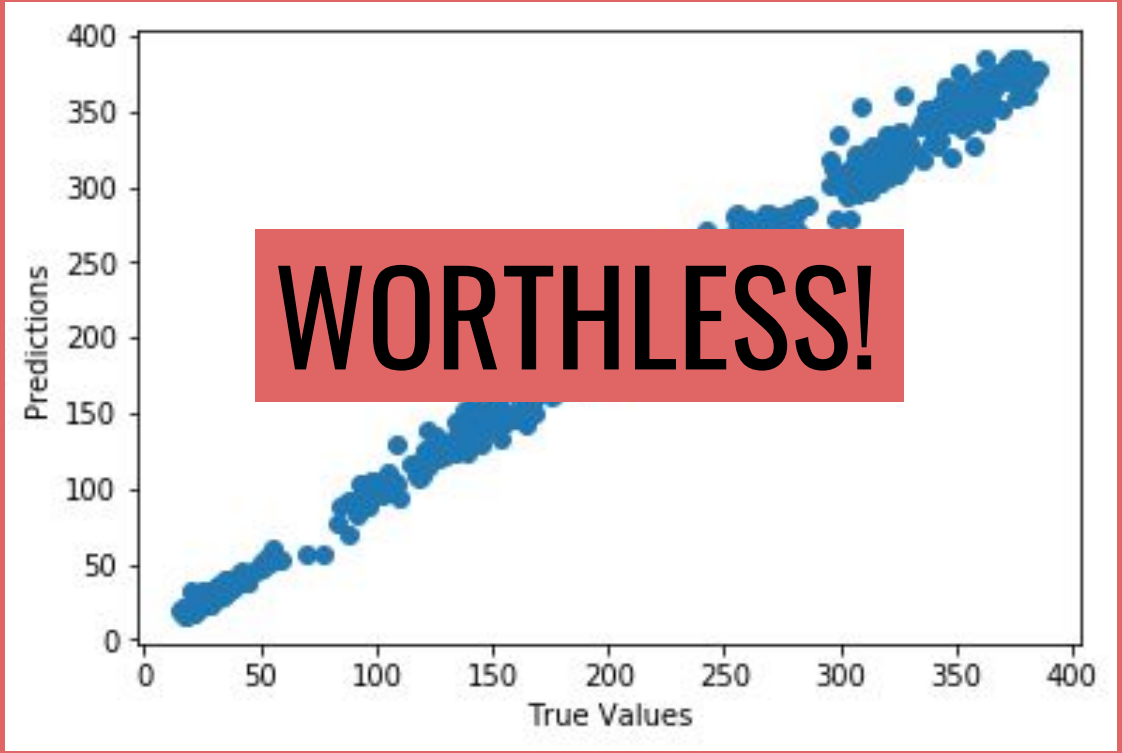
SARIMAX model

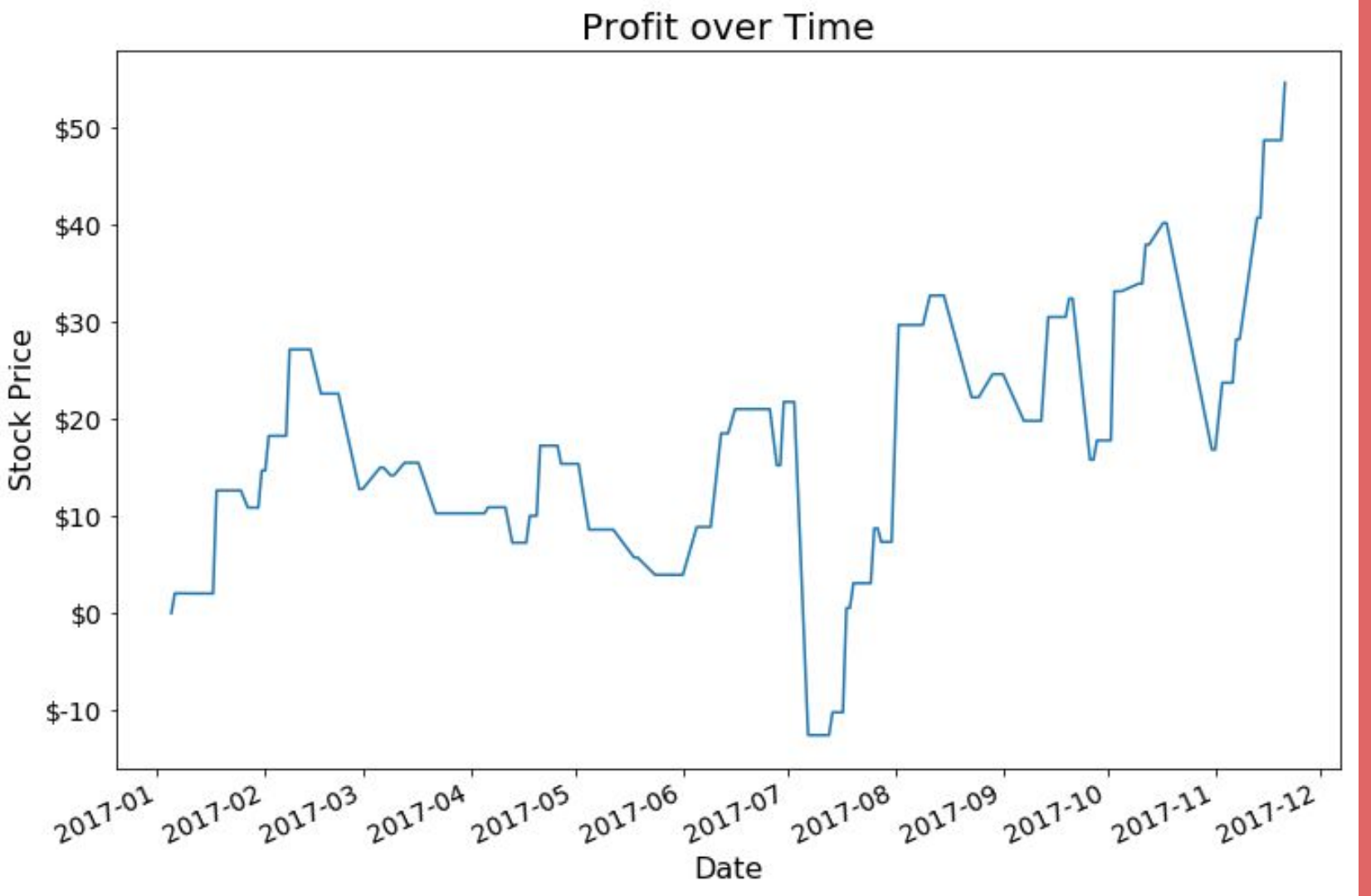
- S: Seasonal
- AR: AutoRegressive
- I: Integrated
- MA: Moving Average
- X: eXogenous regressors model

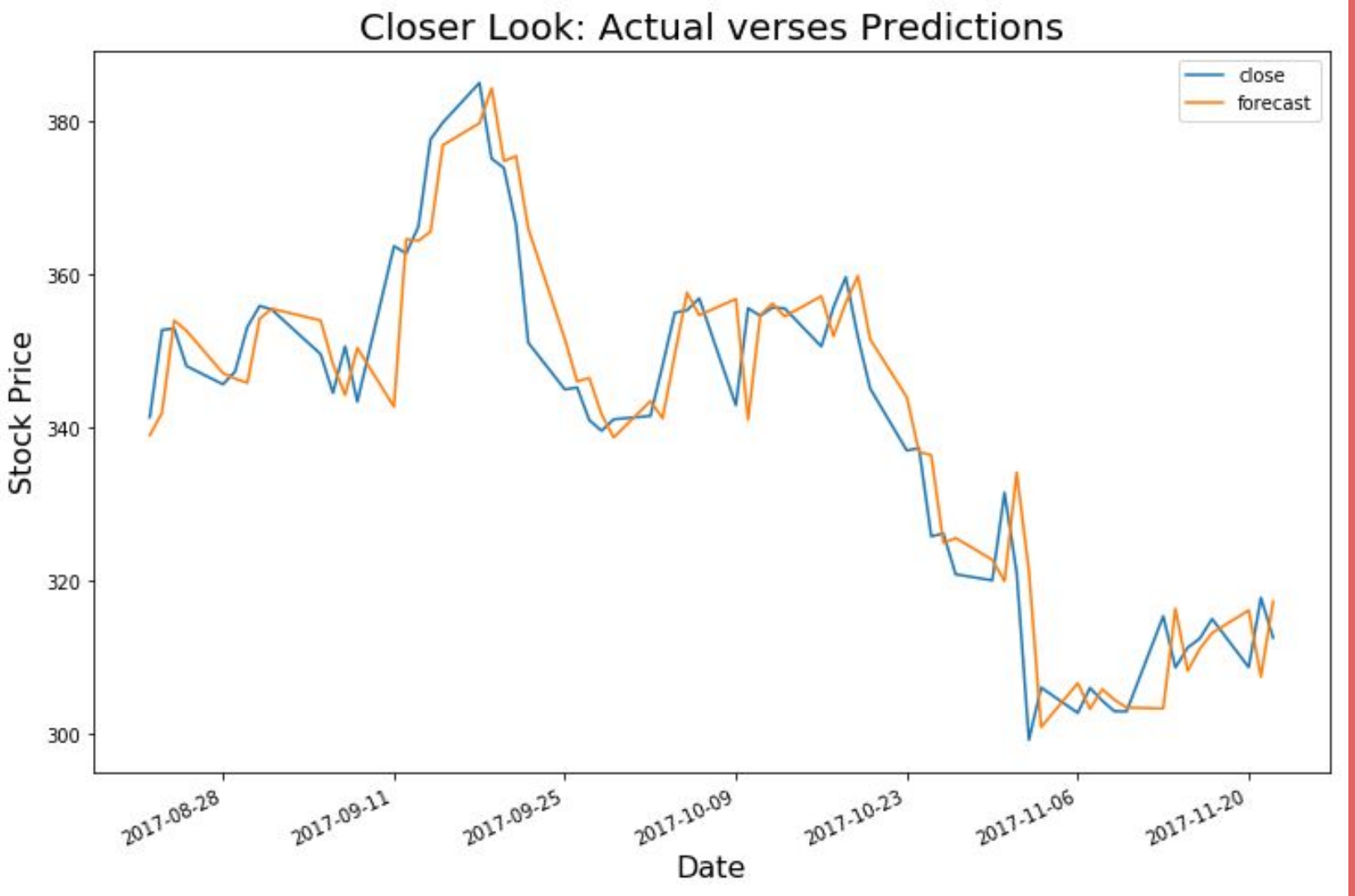

2017 Actual verses Predictions
close
forecast
$375
$350
$325
$300
$275
$250
$225
Stock Price
2017-01
2017-02
2017-03
2017-04
2017-05
2017-06
2017-07
2017-08
2017-09
2017-10
2017-11
2017-12
Date

Evaluation

- Mean Squared Error?
  - 24
- R2?
  - .999




Profit over Time
Stock Price
$50
$40
$30
$20
$10
$0
$-10
2017-01
2017-02
2017-03
2017-04
2017-05
2017-06
2017-07
2017-08
2017-09
2017-10
2017-11
2017-12
Date


Closer Look: Actual verses Predictions
close
forecast
Stock Price
380
360
340
320
300
2017-08-28
2017-09-11
2017-09-25
2017-10-09
2017-10-23
2017-11-06
2017-11-20
Date

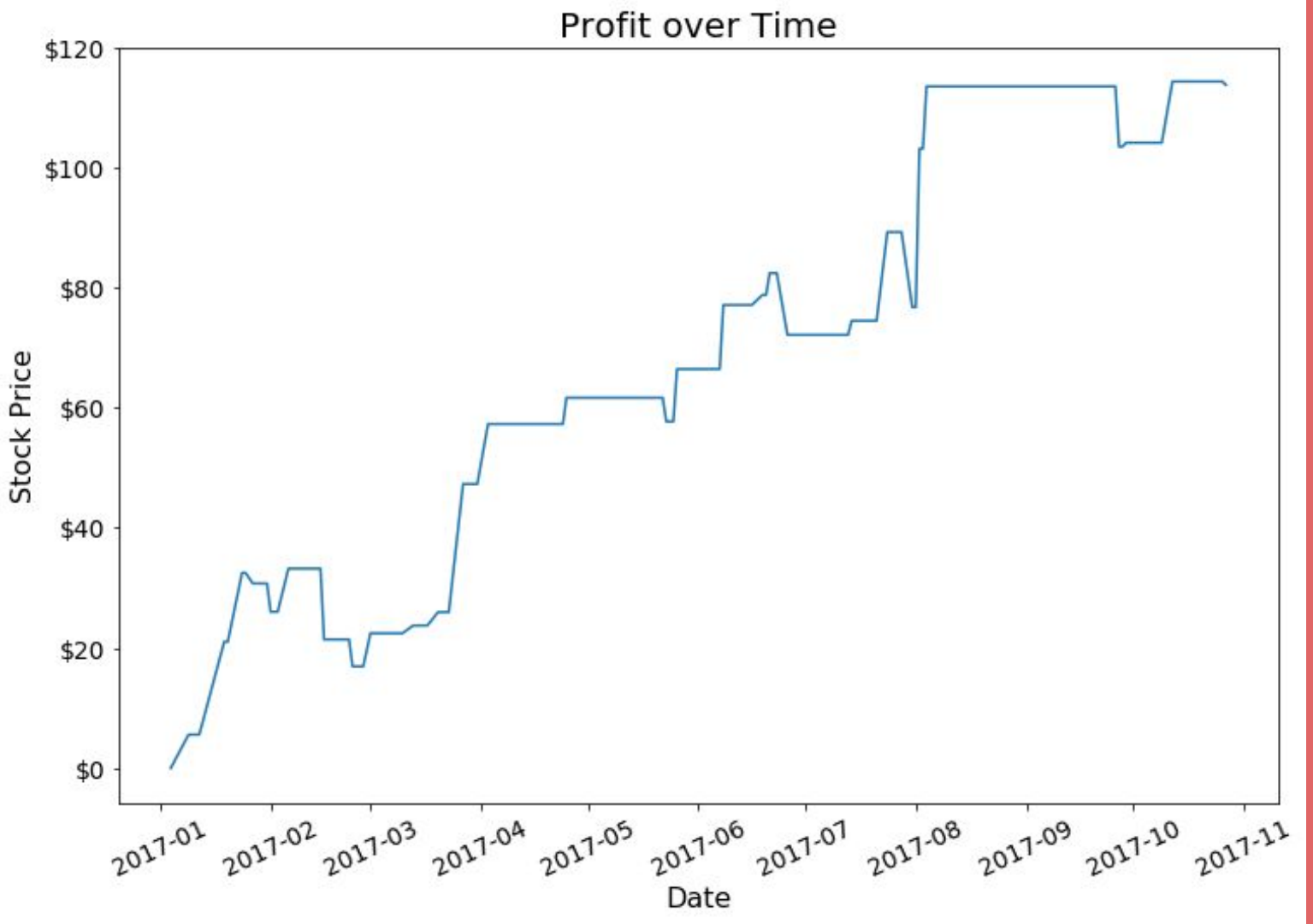
Alright, let’s bring in Natural Language Processing

News Sources

- @elonmusk: CEO of Tesla tweets 3 to 4 times a day (2013 to today)
- @Tesla: 3 to 4 times a day (2014 to today)
- Techmeme: news aggregate site; headlines and sources (2007 to today)

NLP effects

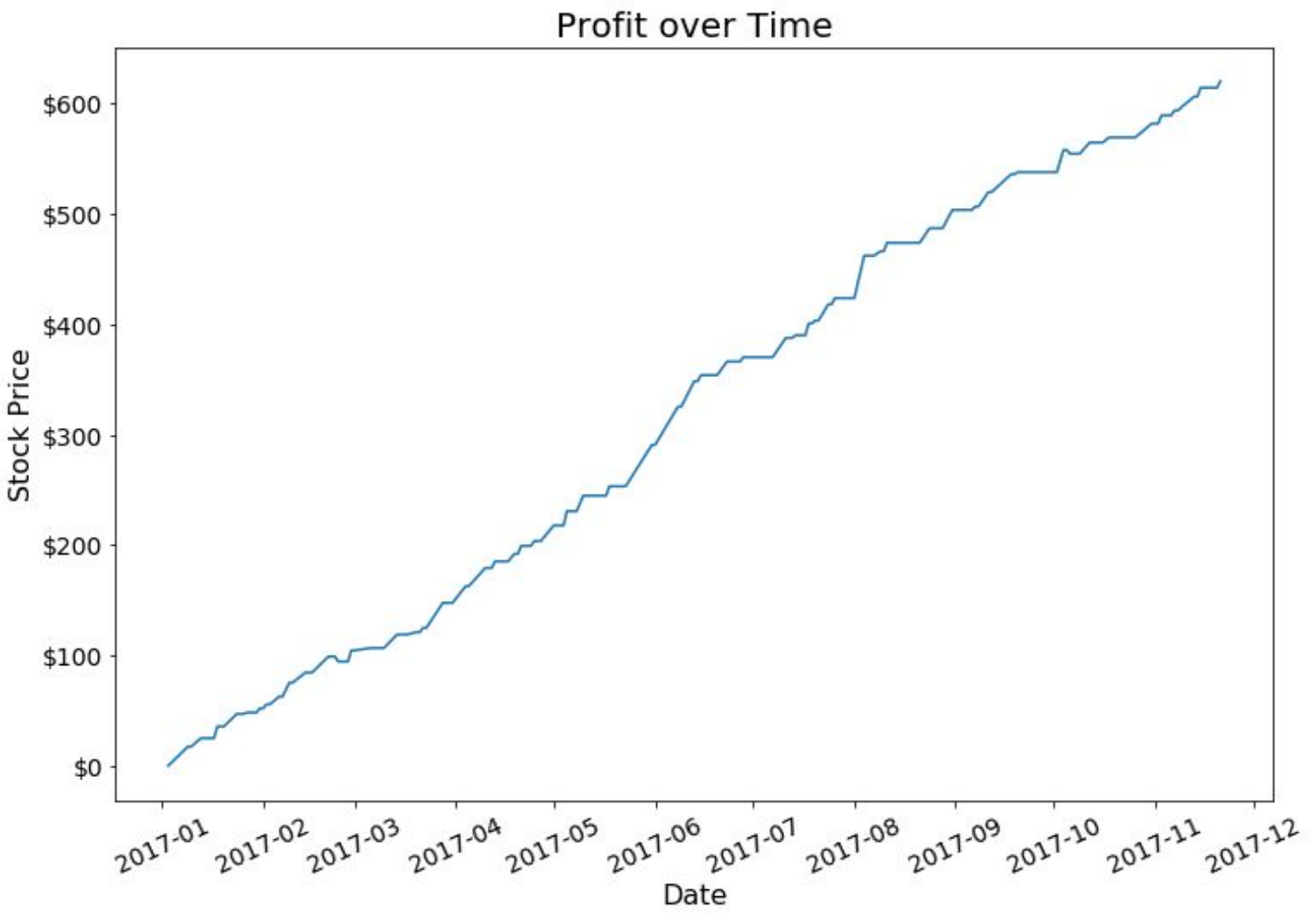
- Accuracy overall increased from 51% to 55% and as much as 60%
- Most gain was in Specificity, but often as the cost of Sensitivity
- Sentiment/Polarity affected the model but did not seem to help in test cases


Profit over Time
$120
$100
$80
$60
$40
$20
$0
Stock Price
2017-01
2017-02
2017-03
2017-04
2017-05
2017-06
2017-07
2017-08
2017-09
2017-10
2017-11
Date

Improvements?

- More news sources (include Twitter trends)
- Market trends
  - Carmakers
  - Tech companies
  - Indexes (market in general)
- Tesla business fundamentals
- Long term models (rolling mean)

What does perfect look like?



The greatest teacher, failure is.

- Yoda