

#PredictingTheDow

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Theory

It has long been theorized that the news affects the stock market.

September 11th - when the markets opened on 9/17, NYSE went down 680 points (7.1%)

Lehman Brothers collapse led Dow closing 4.4% or 504 point down.

Quants are already doing this - Hathaway effect

Can we predict the stock market movement from the news?

Efficient Market Theory

it is impossible to "beat the **market**" because stock **market efficiency** causes existing share prices to always incorporate and reflect all relevant information

Problem

Using /r/worldnews (Reddit) to predict whether the stock market(measured by Dow Jones Index) will go up or down

We are given Top 25 News Items of the day, along with

'Open', 'High', 'Low', 'Close', 'Volume', 'Adj Close'

Predictor: 'Label' (1 if Open-Close >0 else 0)



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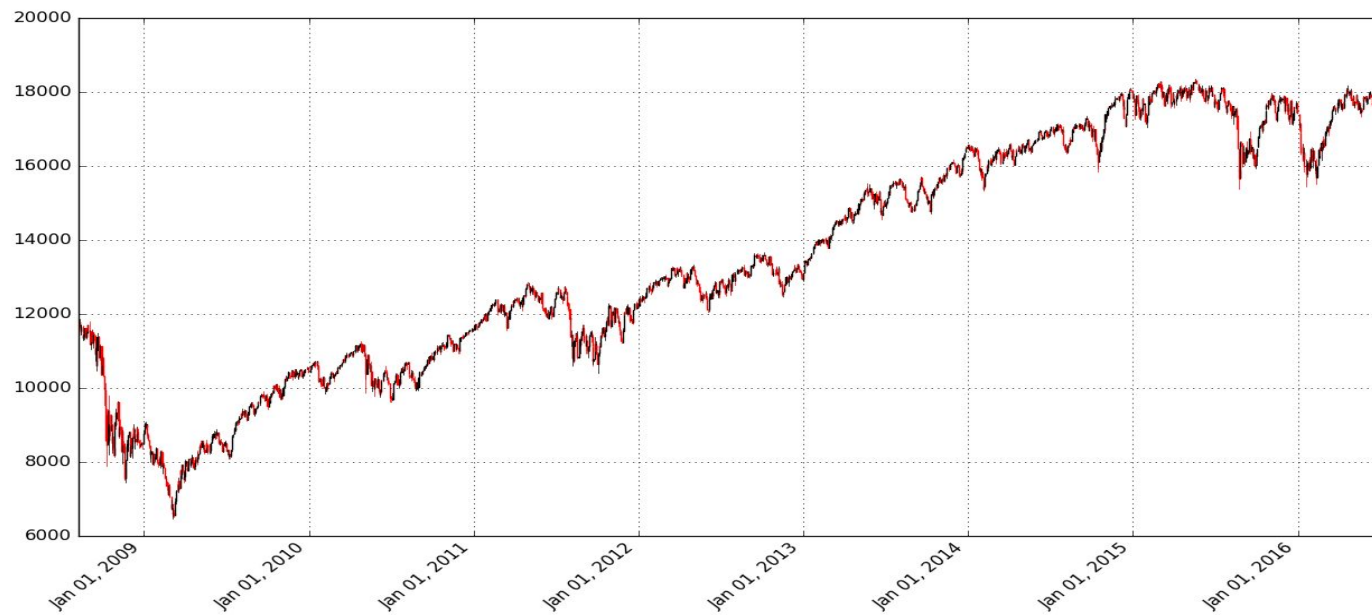
6 1358 INDEPENDENT Tony Blair 'returning to politics' because he thinks Jeremy Corbyn 'is a nutter' and Theresa May 'is a lightweight' (independent.co.uk)

**I MADE ALL MY MONEY IN
THE STOCK MARKET**

**MOSTLY TRADED ON
THE MEOW JONES**



Exploration Time...(candlestick issues)



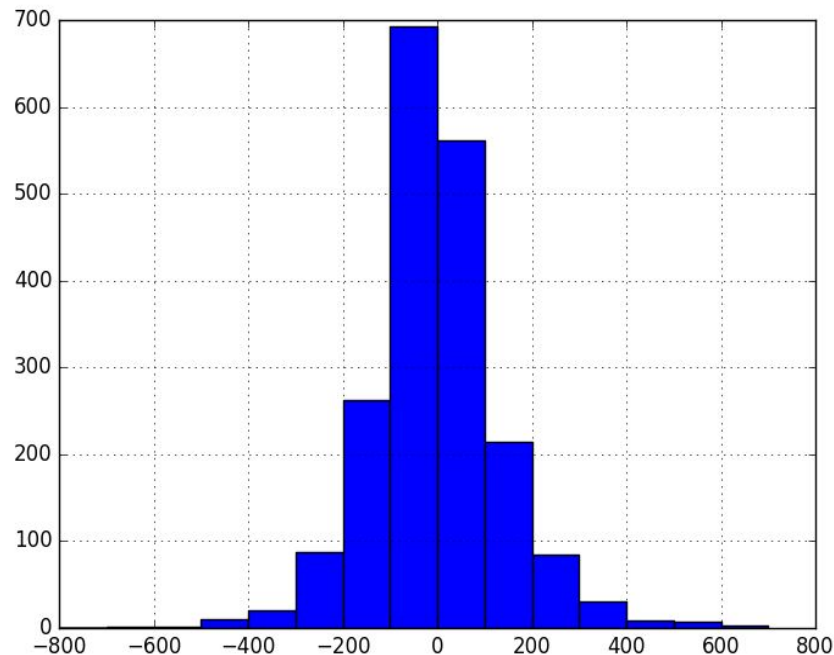
Exploration Time...(cont..)

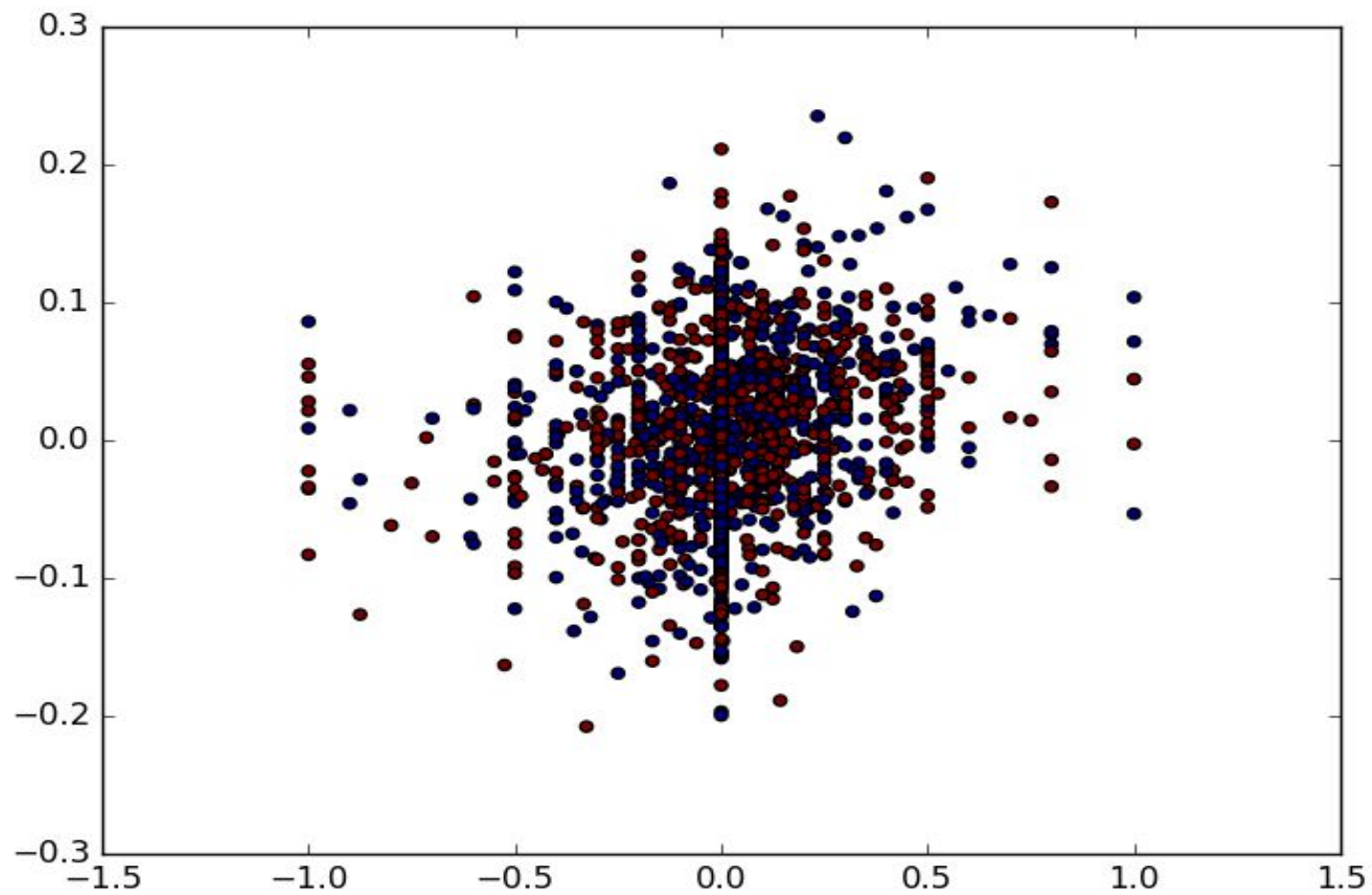
06/08/2008 -> 07/01/2016

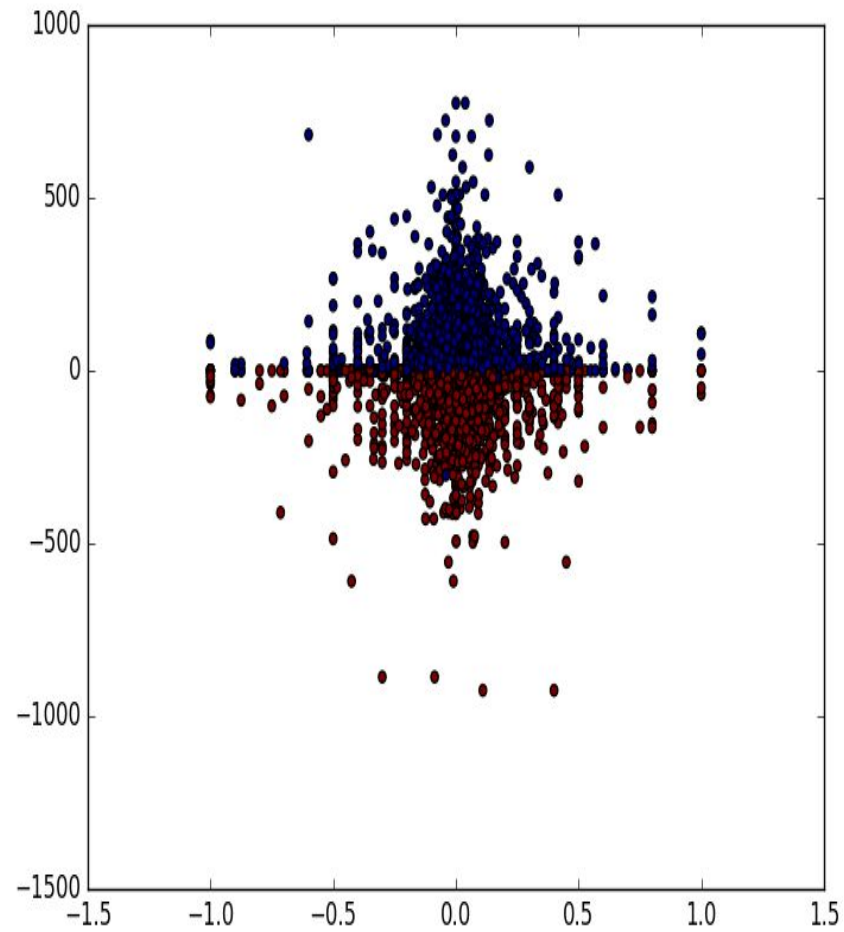
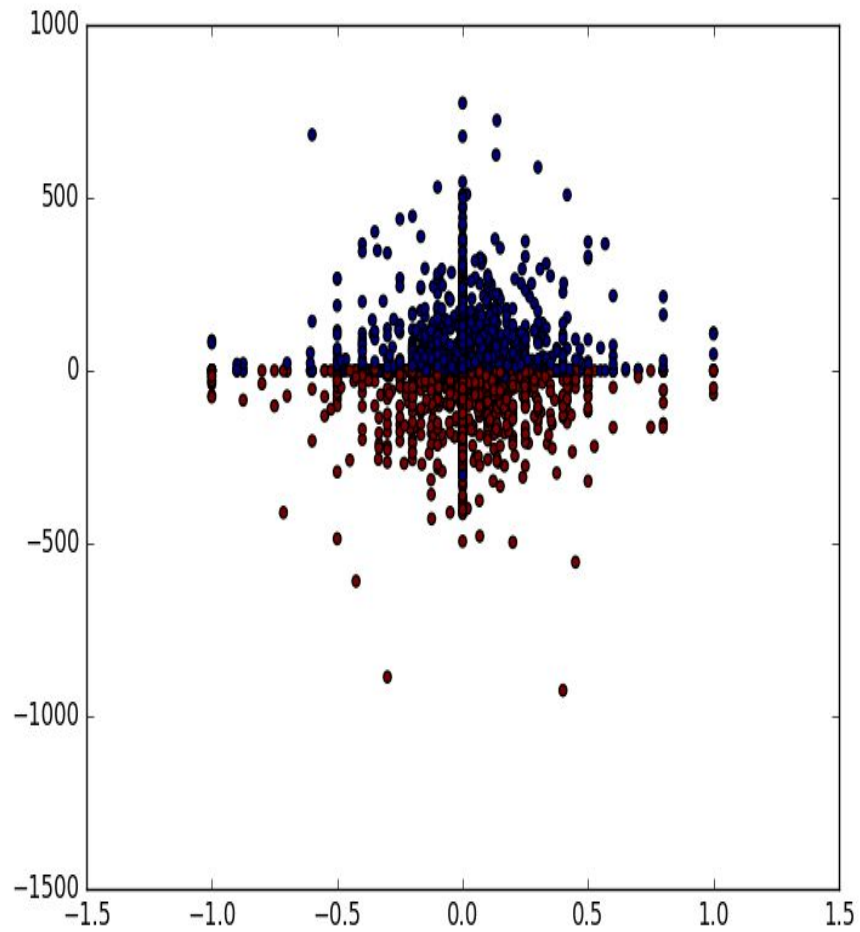
Stock Market went up 53% during that time (the goal to beat)

Can we beat it?!

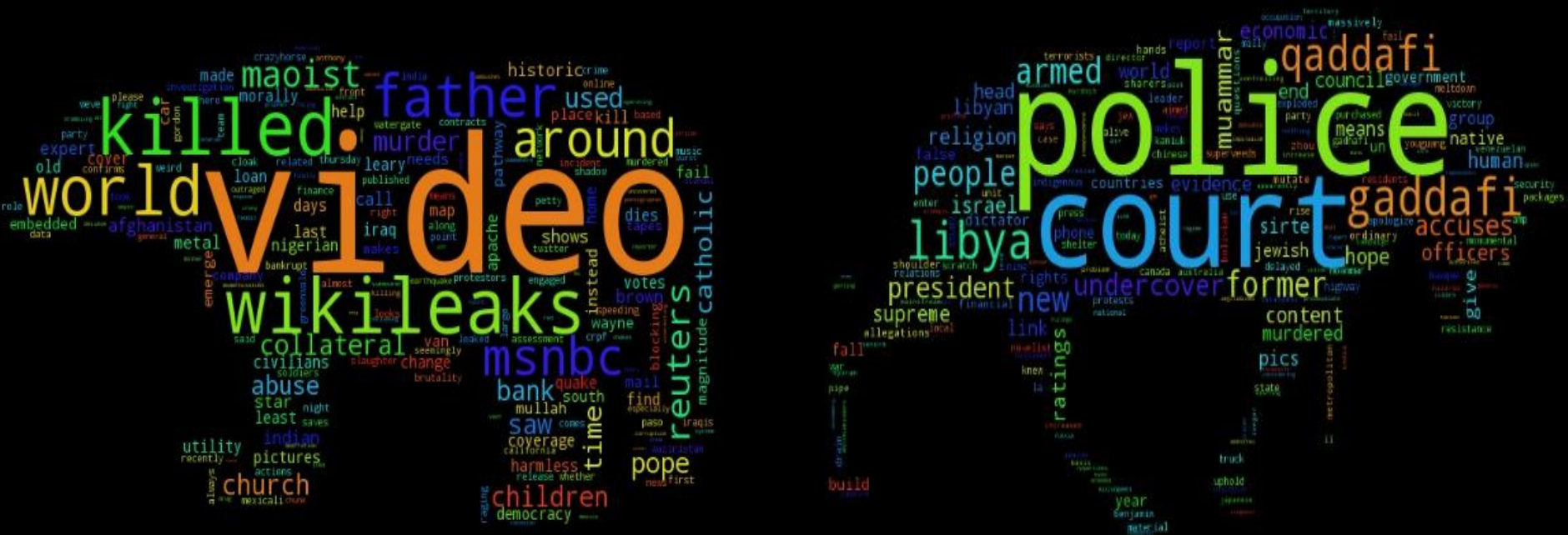
Distribution







Word Clouds



We ran into problems...

In our first or second checkpoint, we reported accuracies of 80% and better

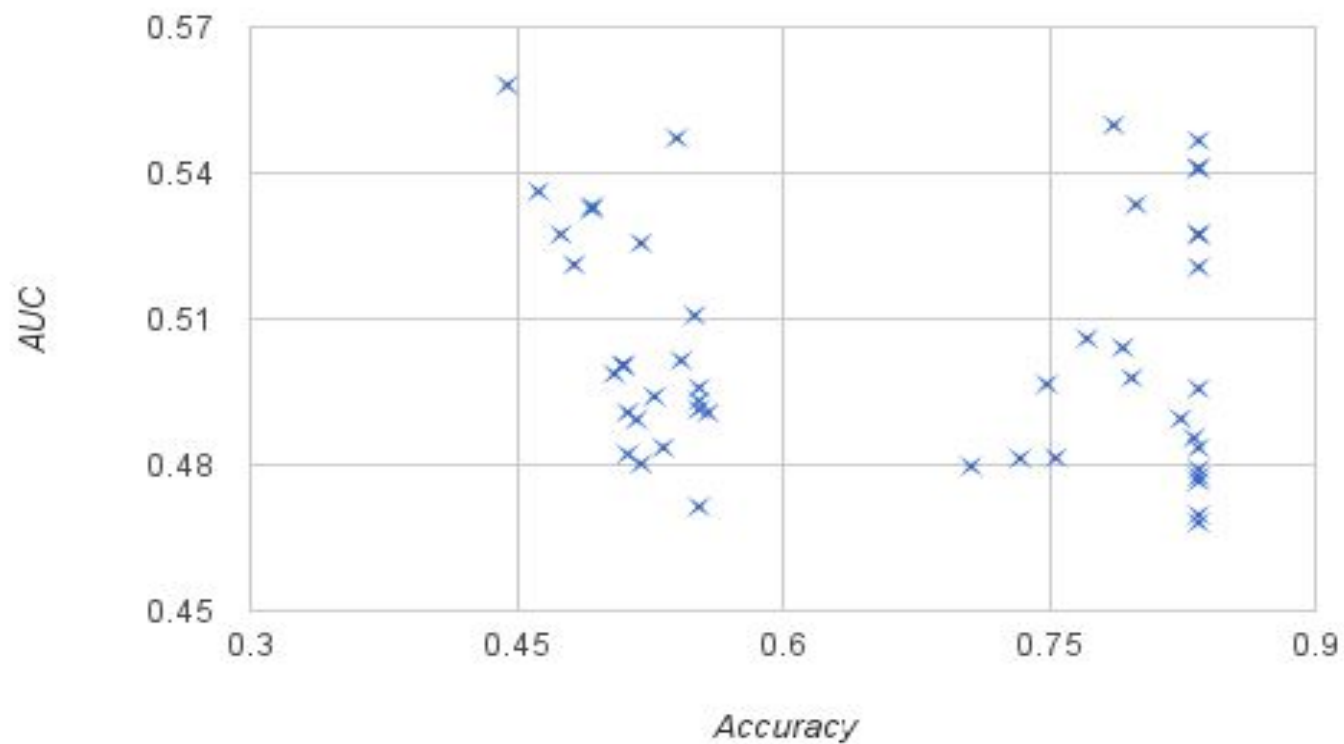
But..we split our training and testing data incorrectly..and some of our training data found its way into our test data as well.

The data was quite messy and CountVectors and Td-idfVectors required stemword removal and stemming

95% of words found when the stock market went down were also found in news articles when the stock market went up

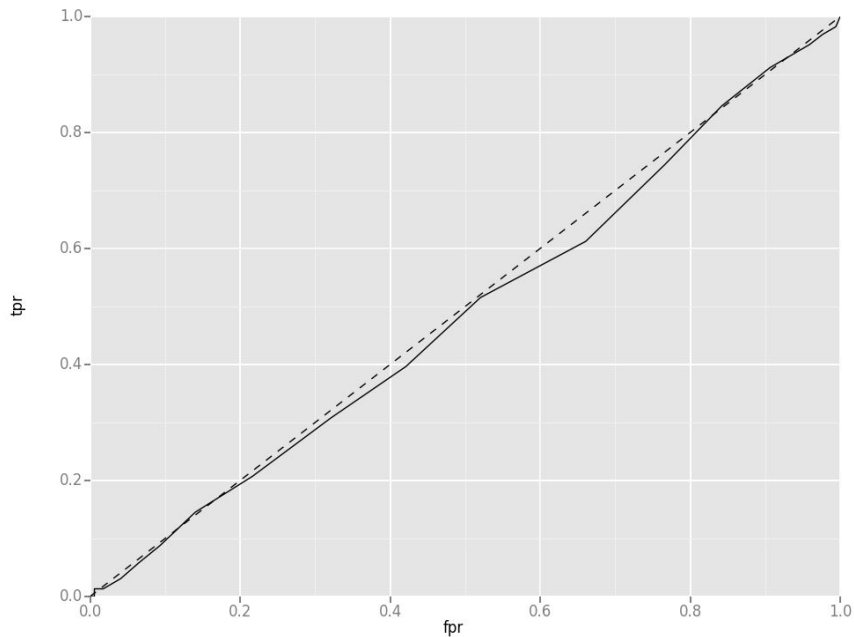
Minor foreign event did not seem to have any effect of the stock market

AUC vs Accuracy

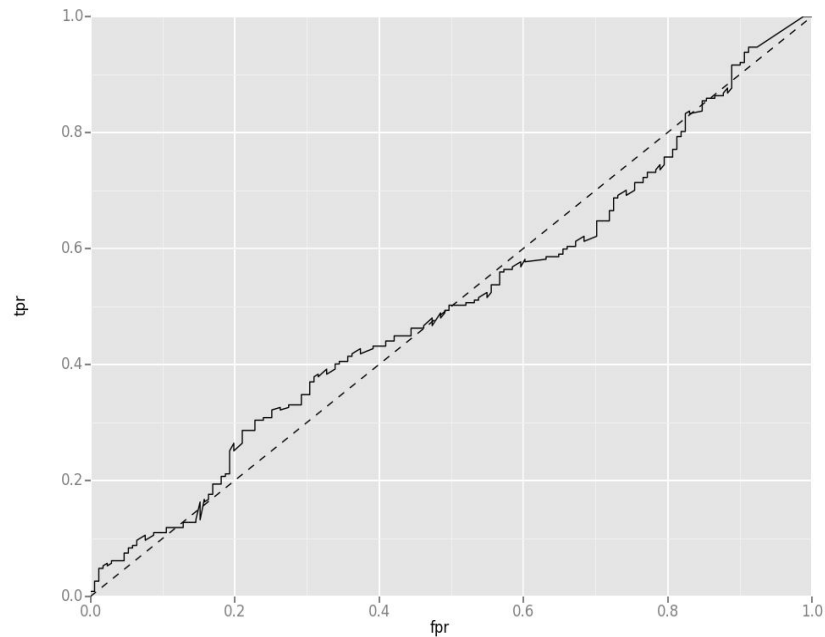


Our Best AUC Curves...

Roc Curve of KNeighborsClassifier



Roc Curve of SVC



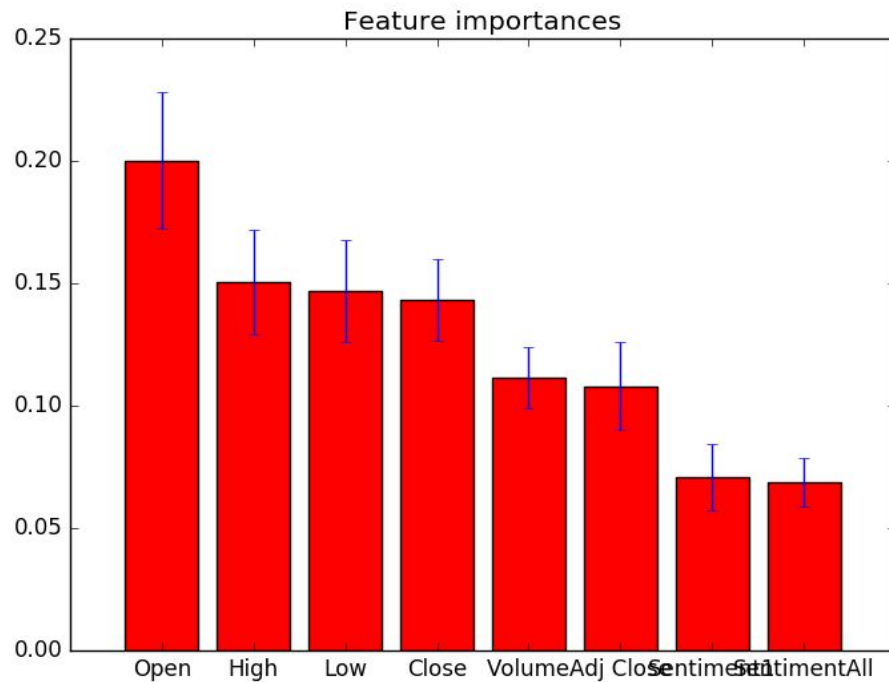
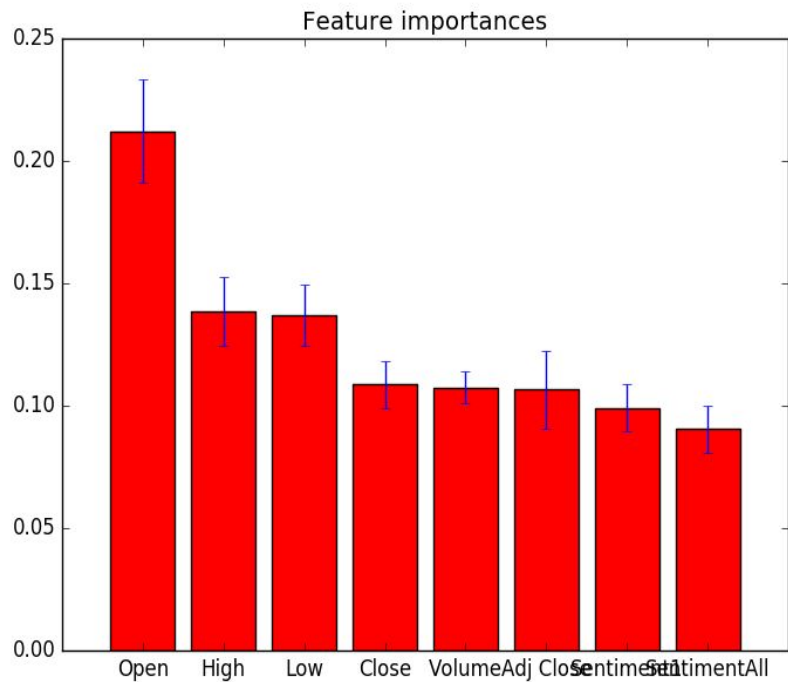
Cross Validation and Model Refining

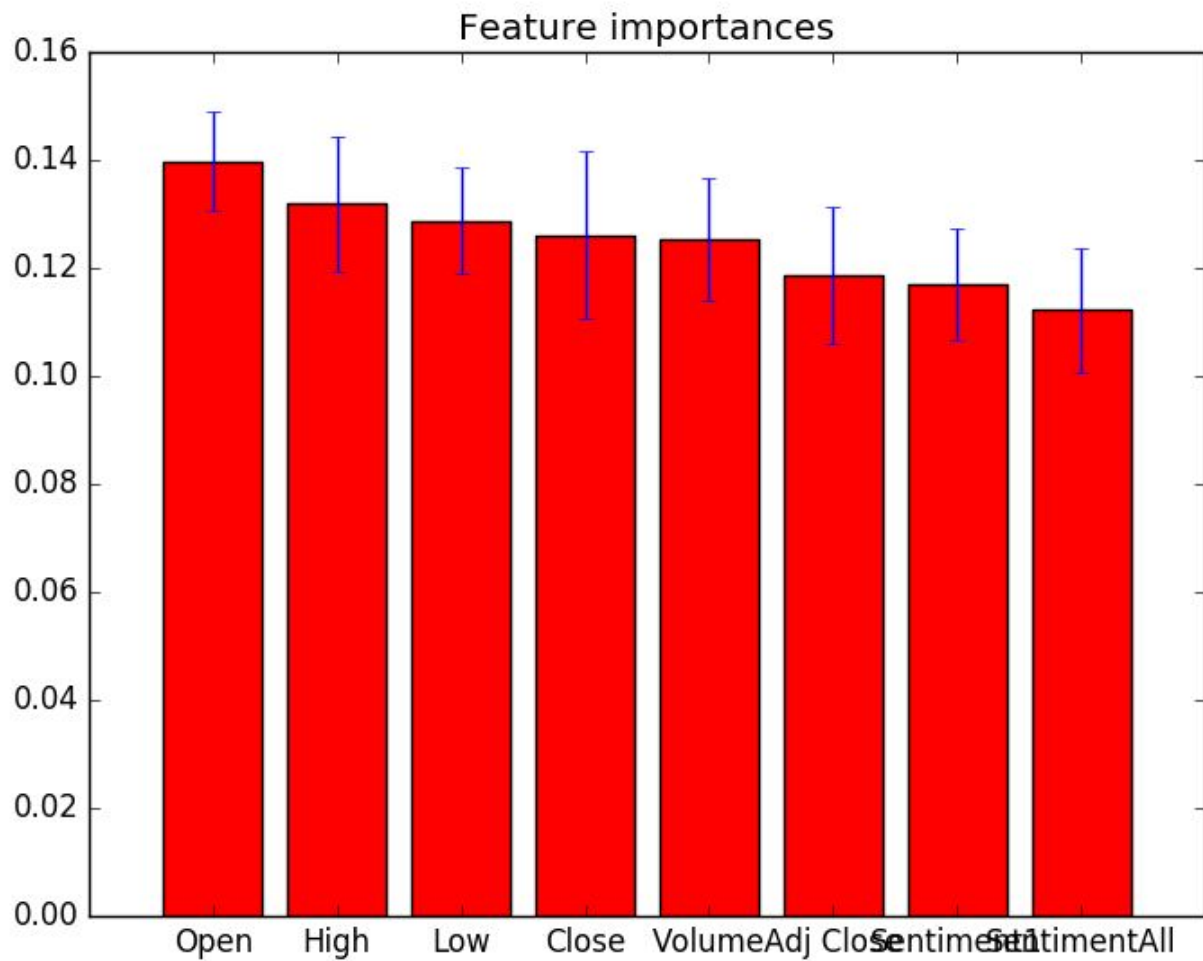
Cross Validating brought most algorithms to have an accuracy of 53%

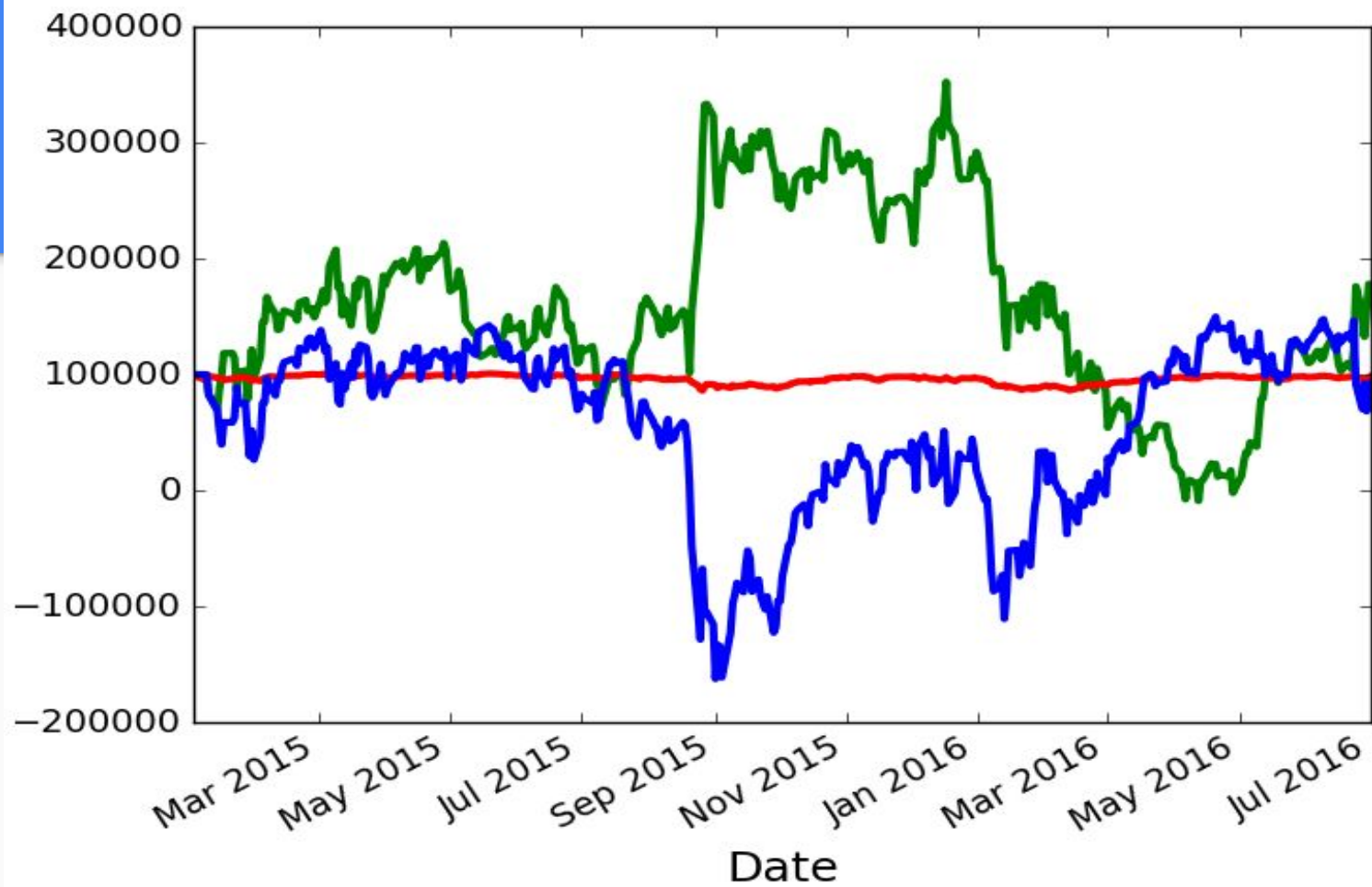
We concentrated on refining KNN. When we optimizing AUC, accuracy was neglected and vice-versa. We were not able to solidly get AUC above $>.5$ and accuracy above $.5$

AUC $< .6$ is quite poor!

Feature Selection







Future Work

Try different text data or more specific data (research with surprisingly good accuracy in this domain)

More, different vectorization

Incorporate numeric data with text data

More backtesting

Regression Analysis

**YOU GOT 80%
RECOGNITION RATE**



WHY NOT 100%

quickmeme.com

**I'M NOT SAYING ITS THE
DATA**



**BUT ITS THE
DATA**

HISTORY.COM

memegenerator.net

Conclusions

Given the text data that we have, we can't accurately predict whether the stock market will go up or down

Dataset was created for Deep Learning course, maybe a deep learning approach would be beneficial

There's a lot a foreign news that doesn't impact a the stock market. What would happen if we tried a different text source?

What if we analyzed Apple Reddit News vs Apple Stock?