Harambe Investments

Motivation

Our motivation is to help investors make informed investment decisions for short term gains. Currently, there are no publicly available tools that provide this type of analysis. Thus, it can be overwhelming for new investors to enter the market.

Stocks and investments are essential to the business sector, and understanding the various trends that affect a company's stock is vital to access growth.

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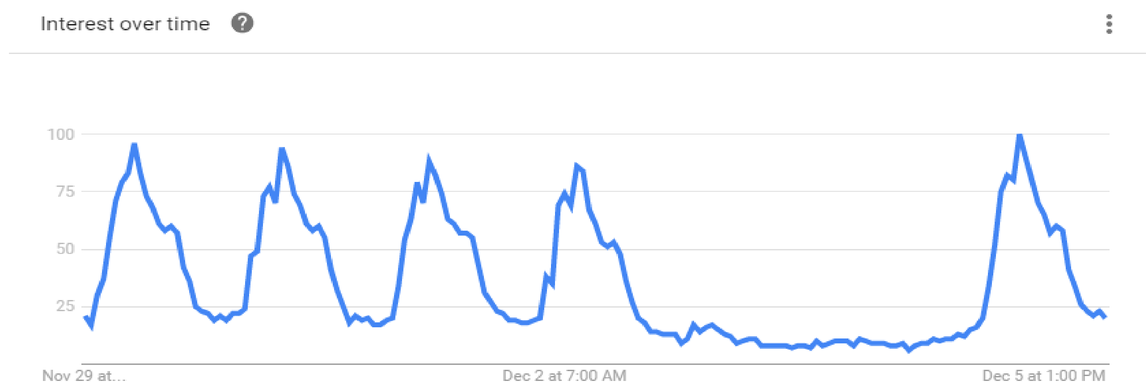
Data

Our first dataset is from Yahoo Finance, where various metrics are pulled. This includes PEG ratio, PE ratio, short ratio, and historical stock prices.
Our second dataset is from Google Trends and contains the changes in the search trends of the company.
All data obtained is from the past week, because our application is for short-term analysis.



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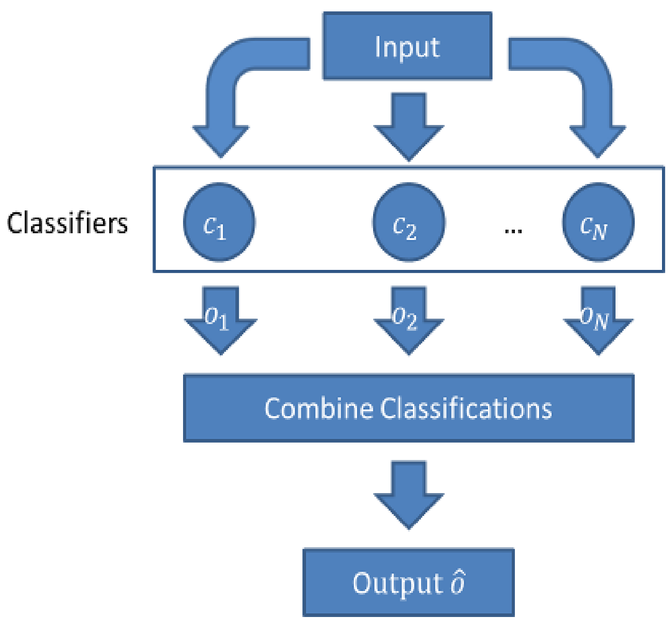
Approaches



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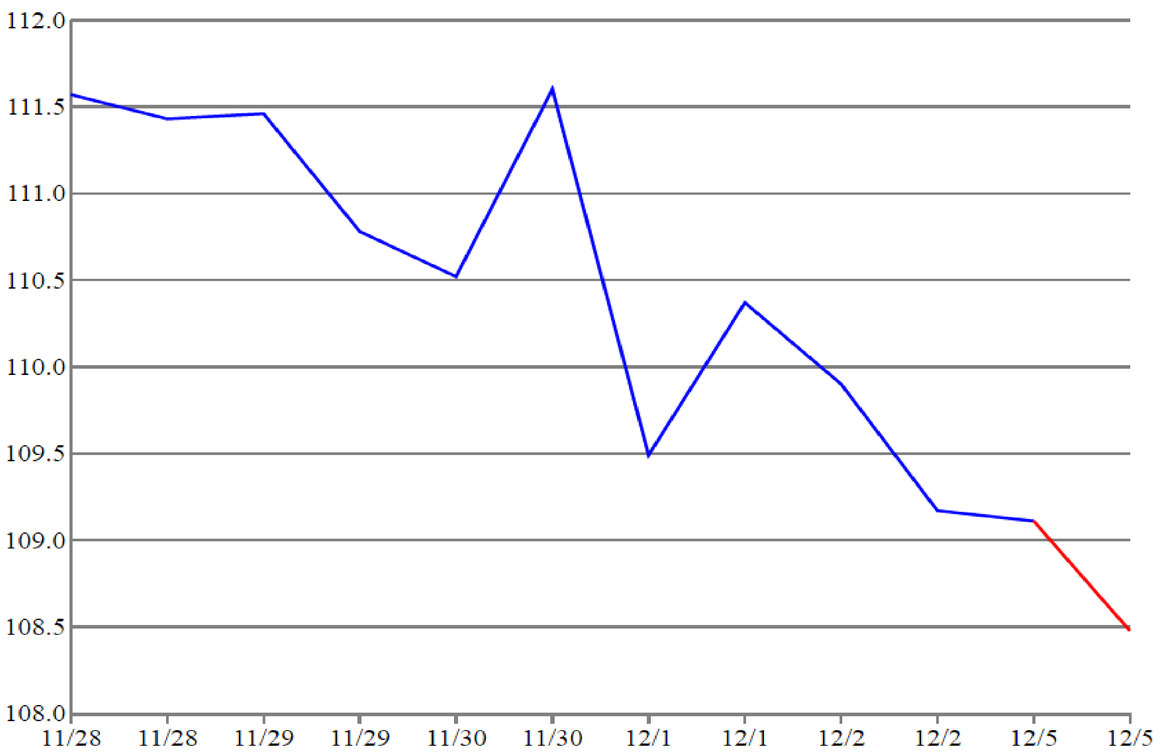
This solution is effective because our ensemble learning approach uses metrics that accurately estimate the stock price.

What makes this approach unique is the combination of Google Trends with ensemble modeling approach on stock metrics.

Our results are based on an ensemble learning approach where we evaluate the problem by breaking it up into sub-problems. We take the results of each sub-problem and combine them to obtain a final model.

To train each sub-model we use a learning algorithm based on gradient decent, where the ground truth for the cost function is the actual change in the stock. This is similar to how neural networks are trained. Overall, this method provides the predicted direction of the stock change.

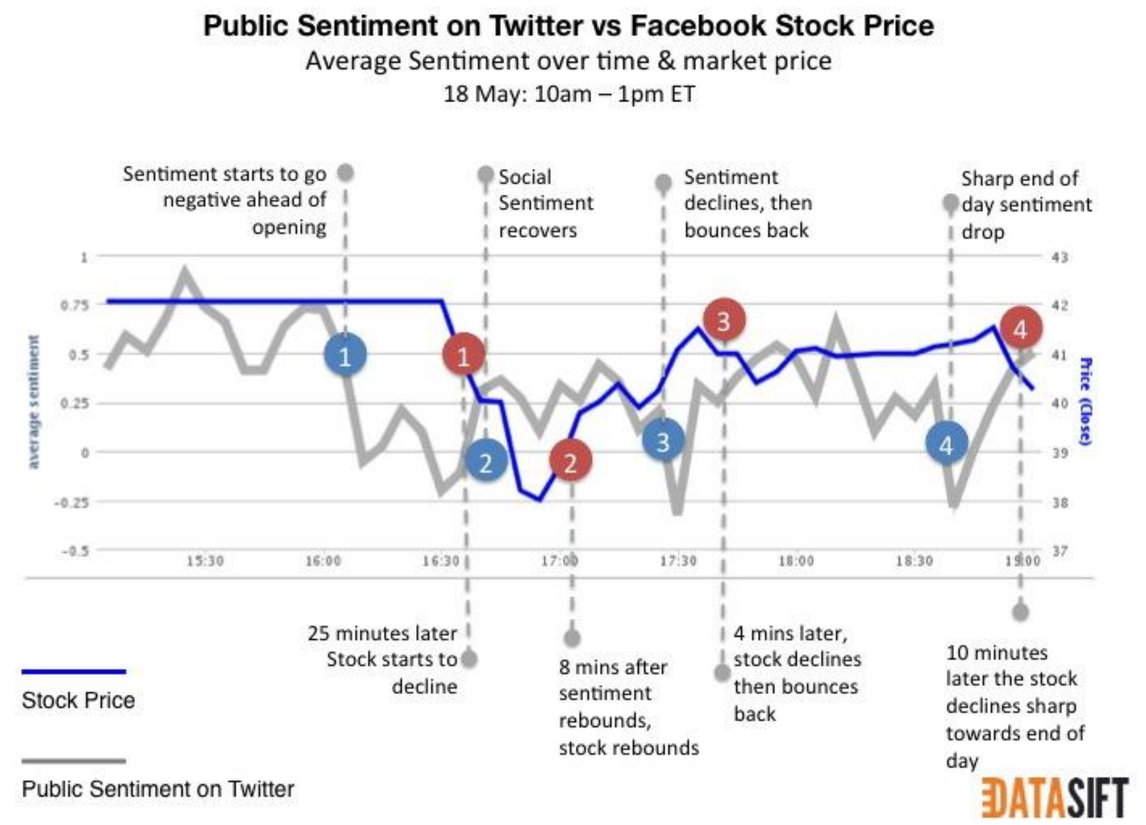
Finally, we combine these predictions with Google Trends data to predict the magnitude of the change in stock price. Essentially, if there is a large change in interest in the company, the model predicts there will be a proportionally large change in the stock.



Experiments And Results

The prediction of the model is compared with real-world outcomes to determine its accuracy, which is then fed back into the ensemble learning algorithm to train the model. Furthermore, using the R^2 value on the correlation between predicted versus actual, the accuracy of the model is assessed. Over time, with more data and training, the goal is to maximize this R^2 value.
Preliminary analysis without training has resulted in 50% accurate direction prediction (as expected). After minimal training the model accurately predicted the direction of change 58.7% of the time.

Twitter Sentiment Analysis: As the figure below shows, Twitter sentiment analysis illustrates a correlation between sentiment and stock price. This project tries to establish a similar correlation between Google Trends and stock price.



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Example Visualization of AAPL (Left) : The graph on the left illustrates what the user will typically see upon searching for a stock. There are two values for each date: open and close. The blue line represents the historical data, whereas the red line is from the predicted model. This would be green if the model predicted an increase (instead of a decrease).