

# Spring 2019 Illini Datathon

TEAM 20 – CHRIS SZUL, TEJO NUTALAPATI, IDRIS KUTI, VISHAL SRIRAM

# Agenda

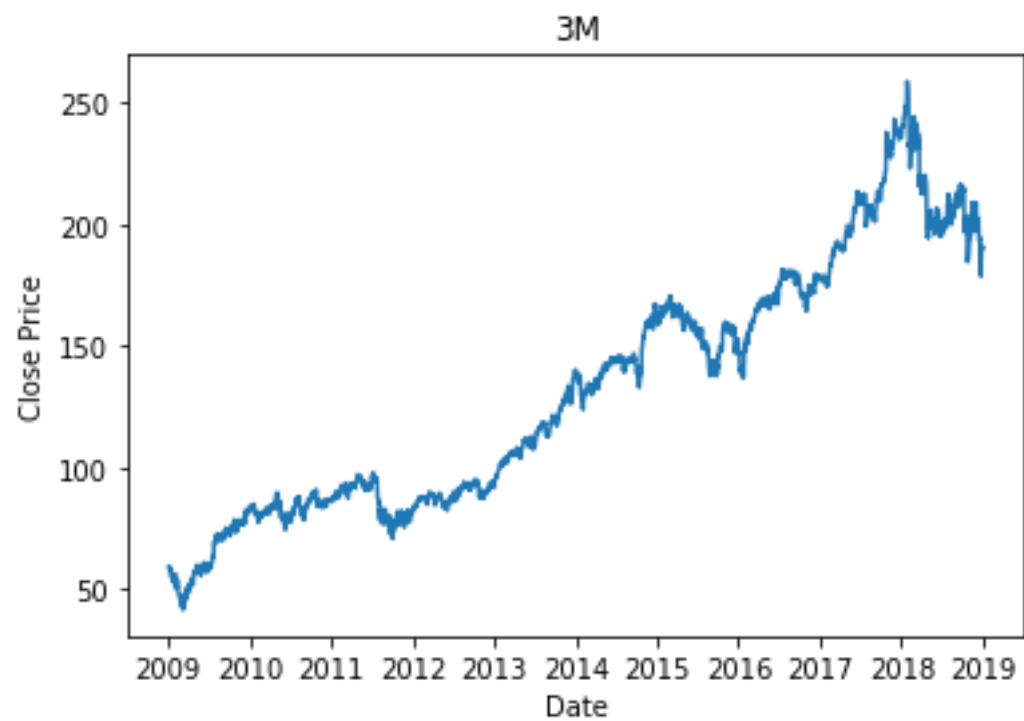
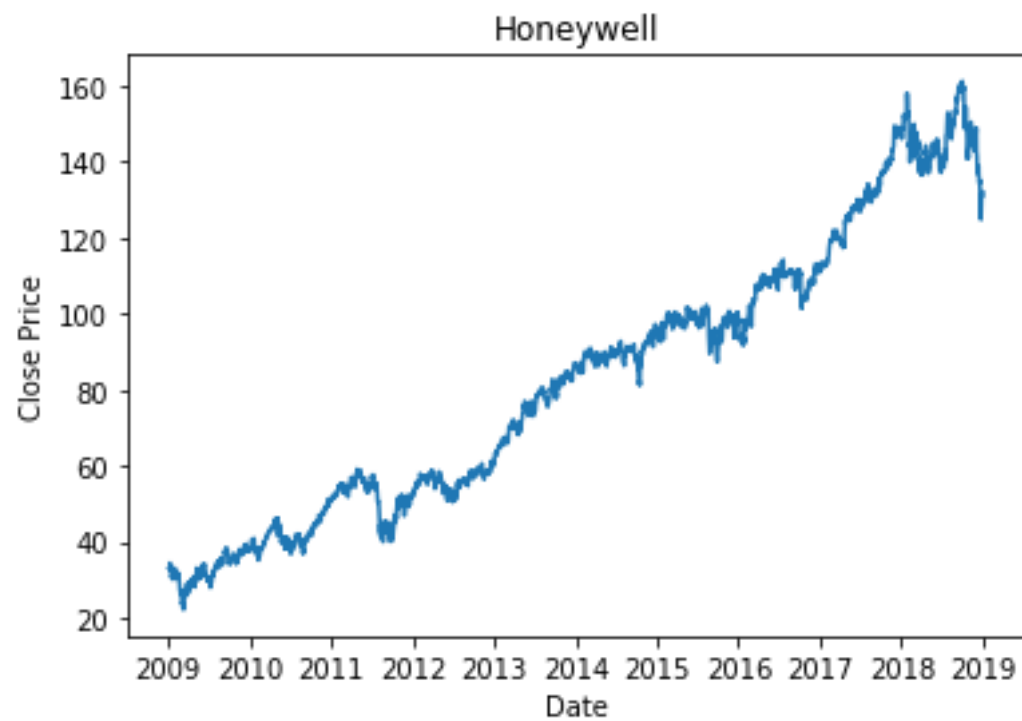
- ▶ Methodology
- ▶ Data Processing
- ▶ Data Visualization
- ▶ Natural Language Processing
- ▶ Summary

# Initial Thoughts

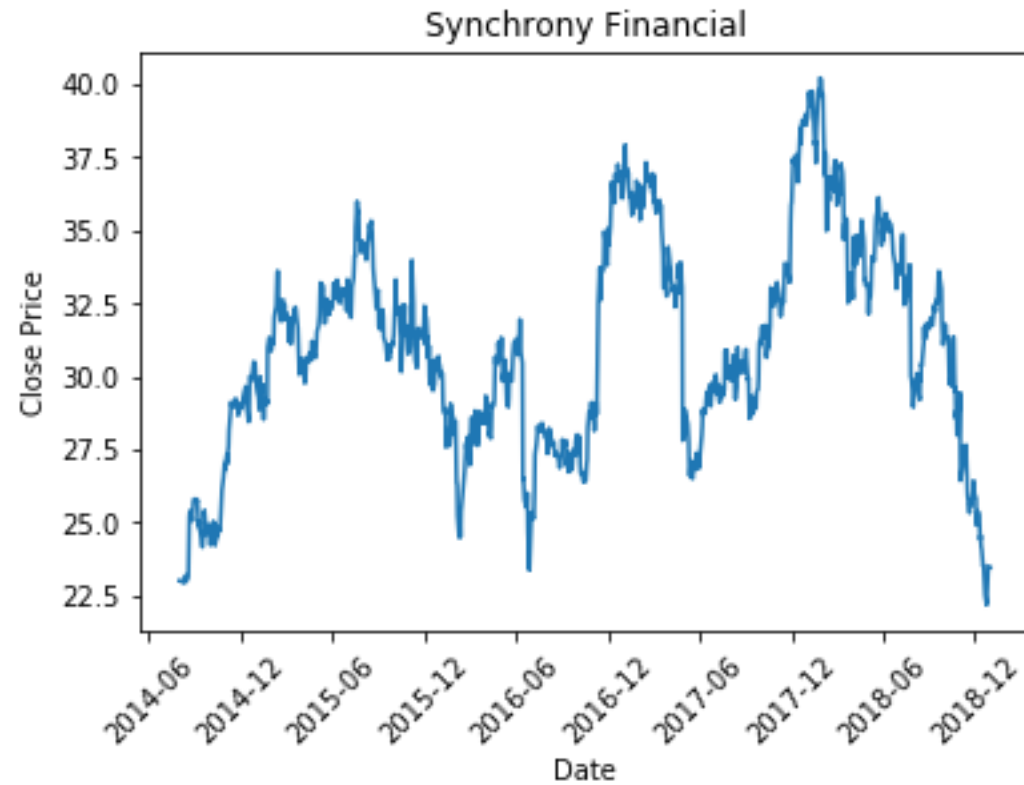
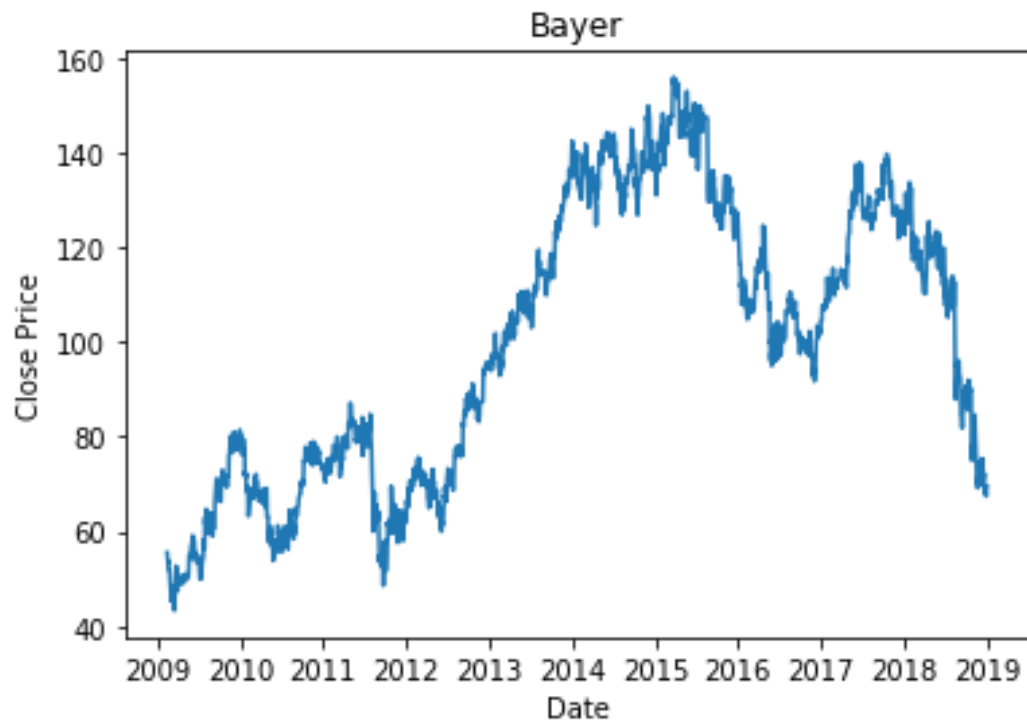
- ▶ Compare each of the four companies we have to their competition
  - ▶ Look for market trends
  - ▶ Variables connecting the companies and their competition together
- ▶ Use a neural network to figure out any patterns that we could forget
- ▶ Look into 10-K Annual Reports from each company
- ▶ Scrap media sources for articles that point to a market failure that would affect the companies given

# Methodology

- ▶ Use the given data to train a Geometric Brownian Motion model
  - ▶ Focus on the end of the data back 4 years
- ▶ Clear out parts of the data that did not change drastically to look for trends
- ▶ Use Twitter to determine if there is negative or positive feelings towards the company



Data

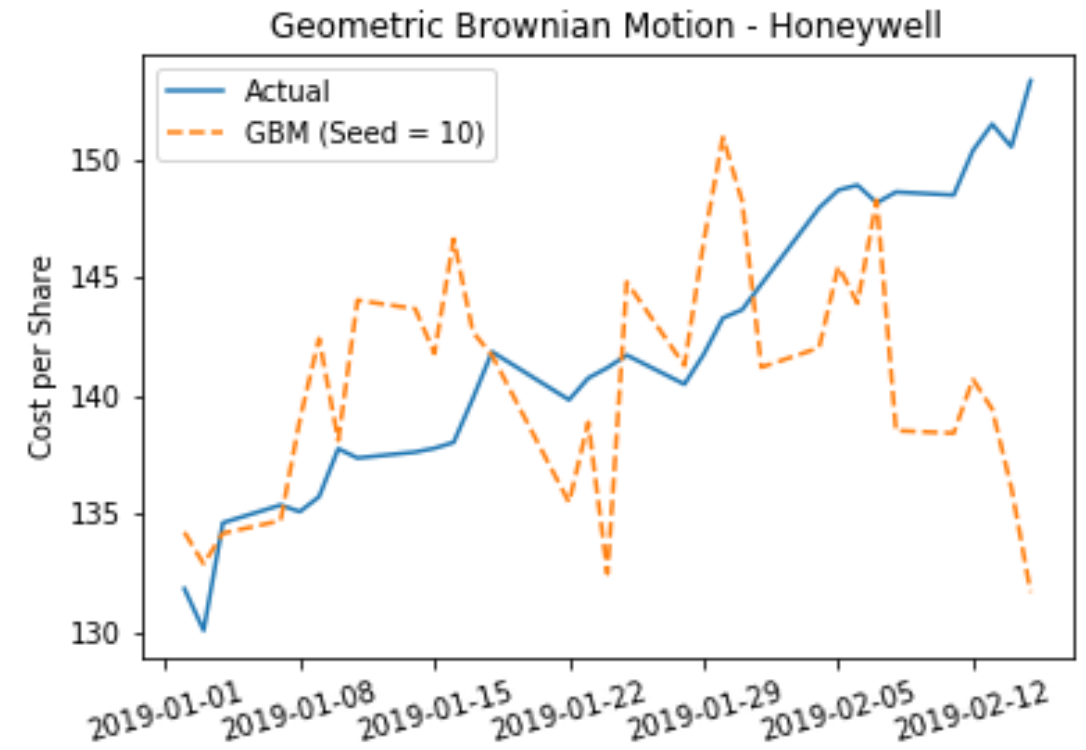
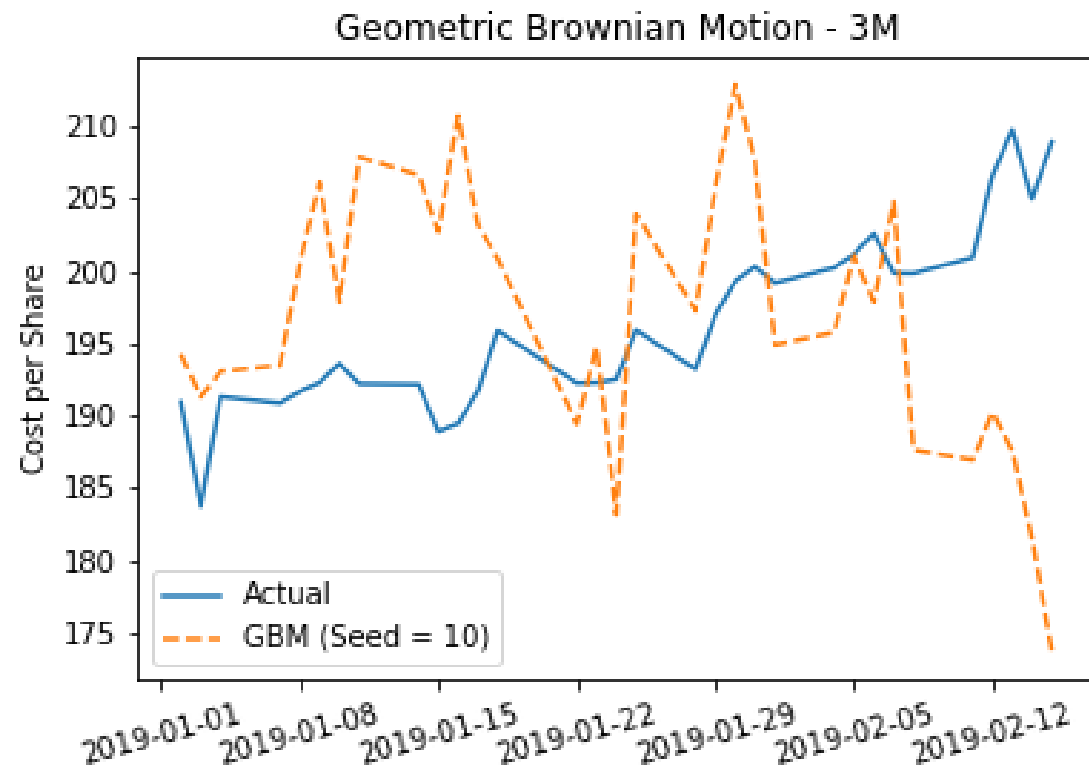


# Data

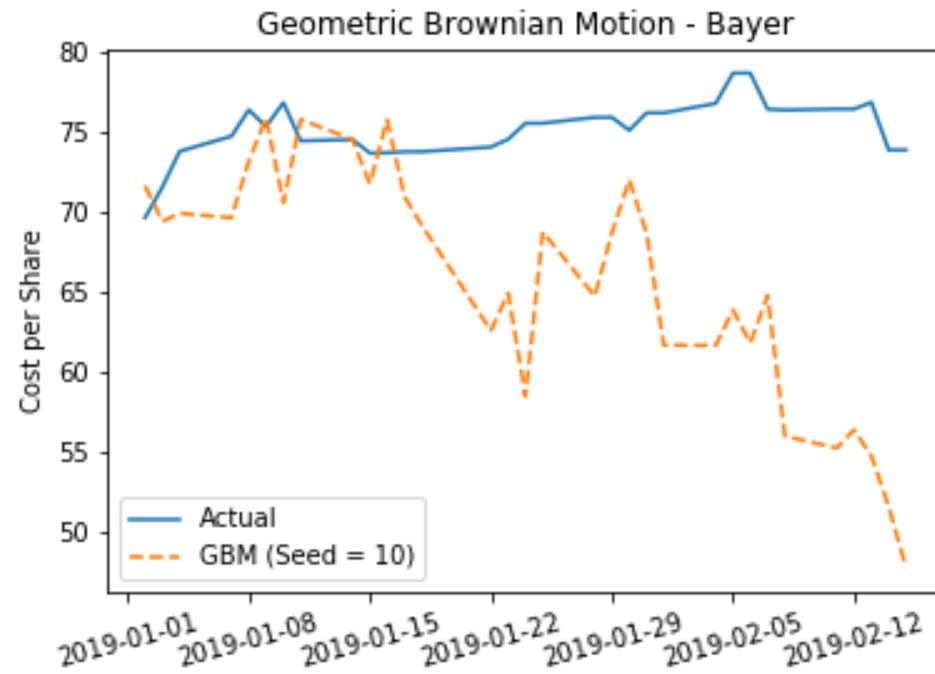
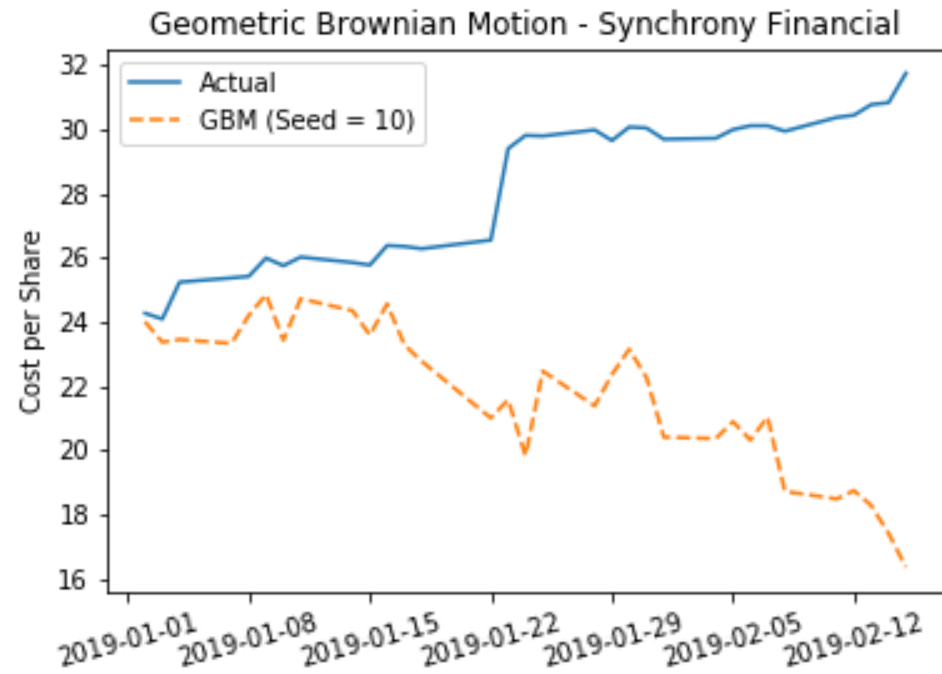
# Geometric Brownian Motion model

- ▶ First, find the Daily Returns
  - ▶  $\text{Daily Returns} = \text{Today's Closing} - \text{Yesterday's Closing}$
- ▶ Then, plug that vector of returns into Drift and Diffusion parameters
- ▶ Finally, using the formulas for Geometric Brownian Motion in Python

# Geometric Brownian Motion Model





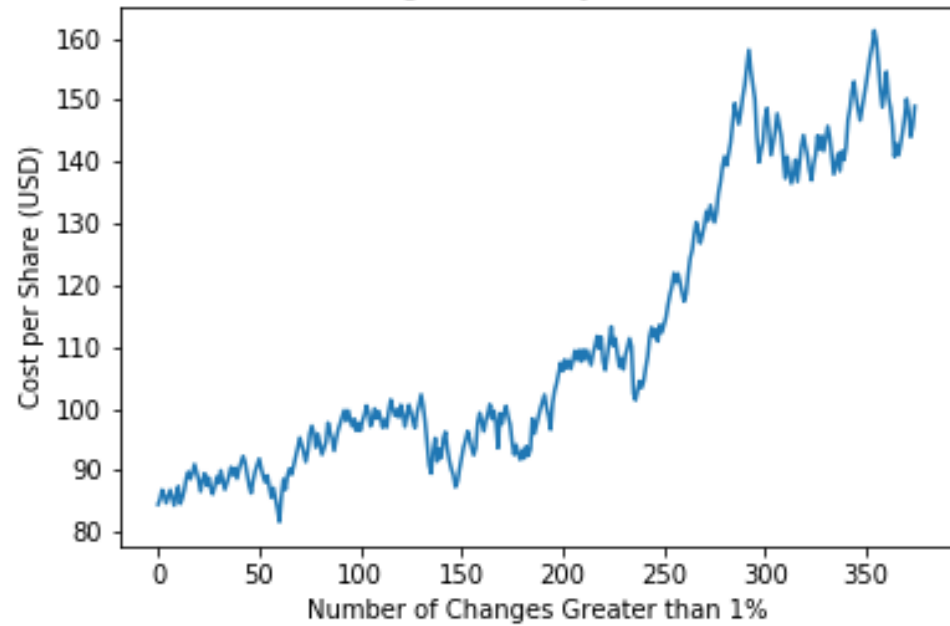


# Geometric Brownian Motion Model

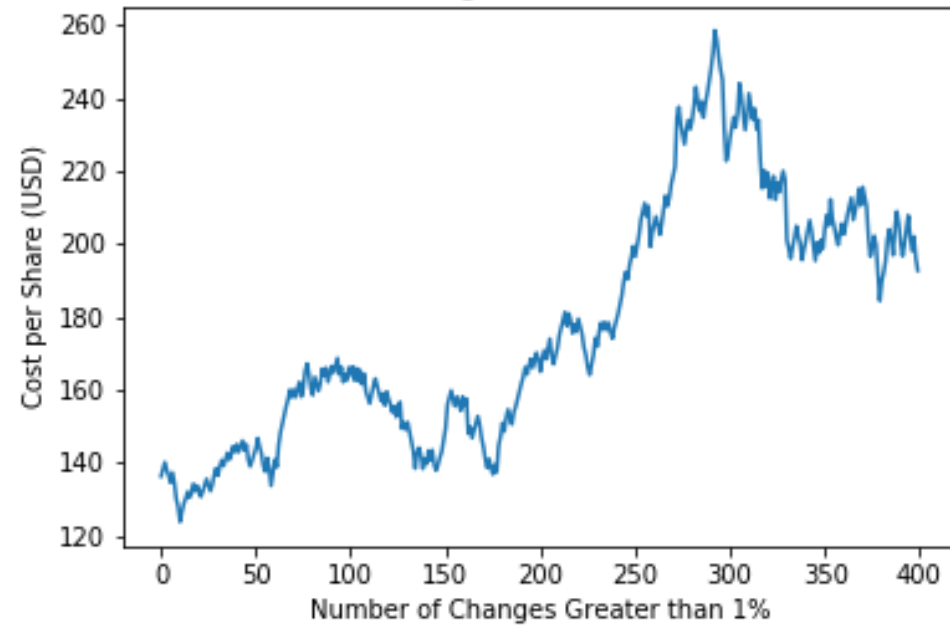
# Clearing Data for Easier Trend Analysis

- ▶ Filter through the data
  - ▶ If the next closing value was less than 1% different than the current closing value, ignore it and move to the next closing value
- ▶ Purpose
  - ▶ Emphasize changes in stock closings
  - ▶ Remove data points that are not essential to establish a trend

Changes in Honeywell Stock

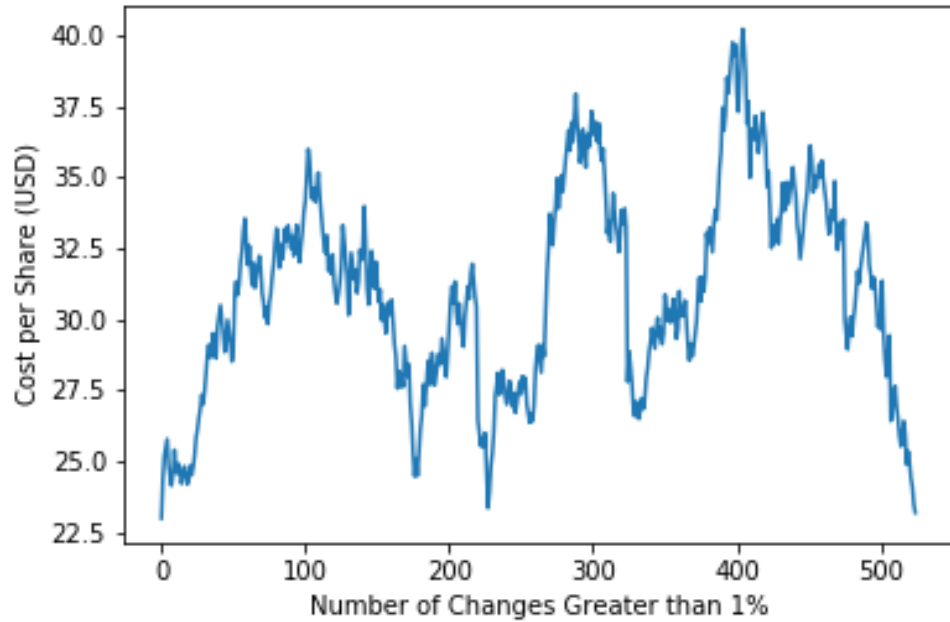


Changes in 3M Stock

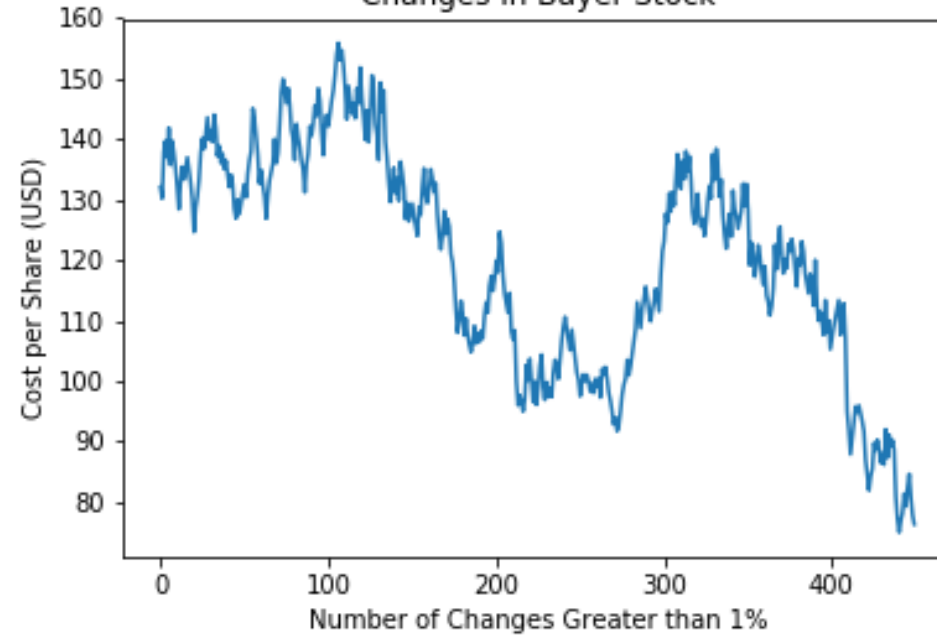


# Clearing Data for Easier Trend Analysis

Changes in Synchrony Stock



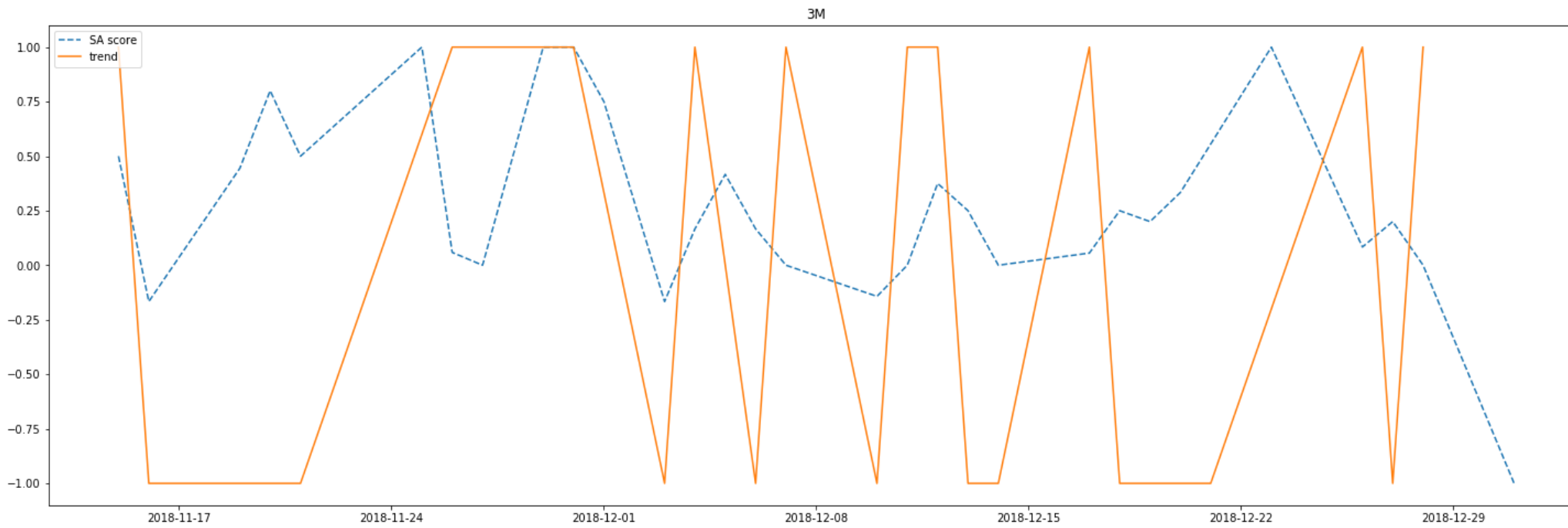
Changes in Bayer Stock



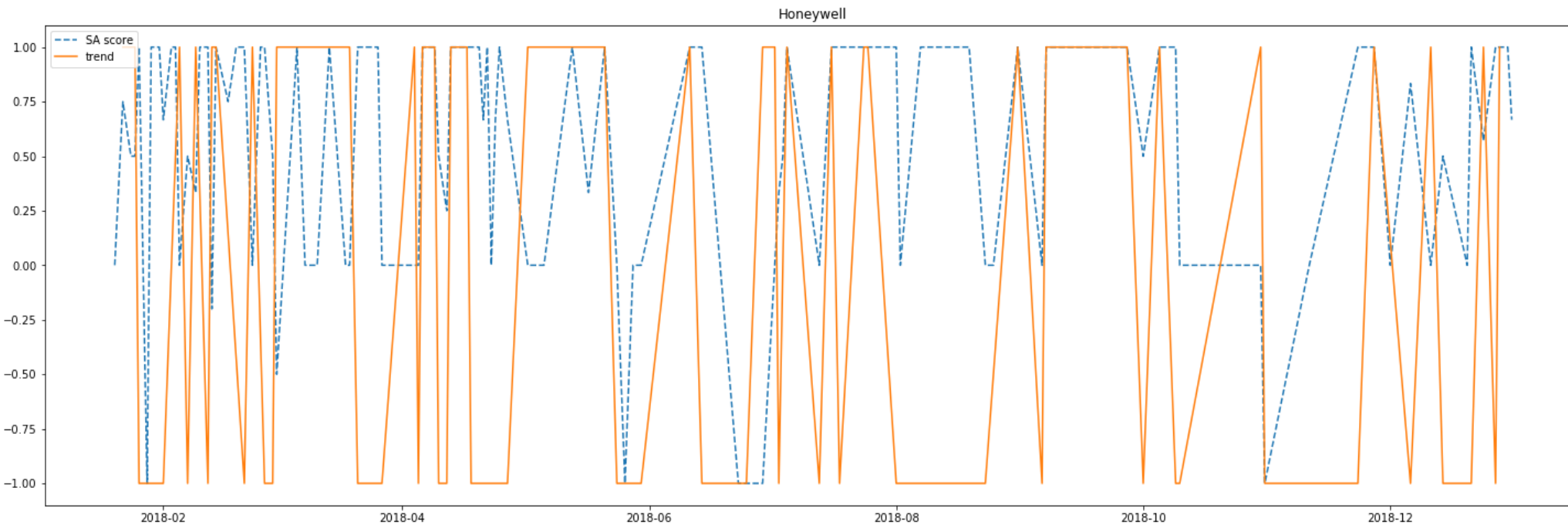
Clearing Data for Easier Trend Analysis

# Using Twitter to gage people's feelings to the companies

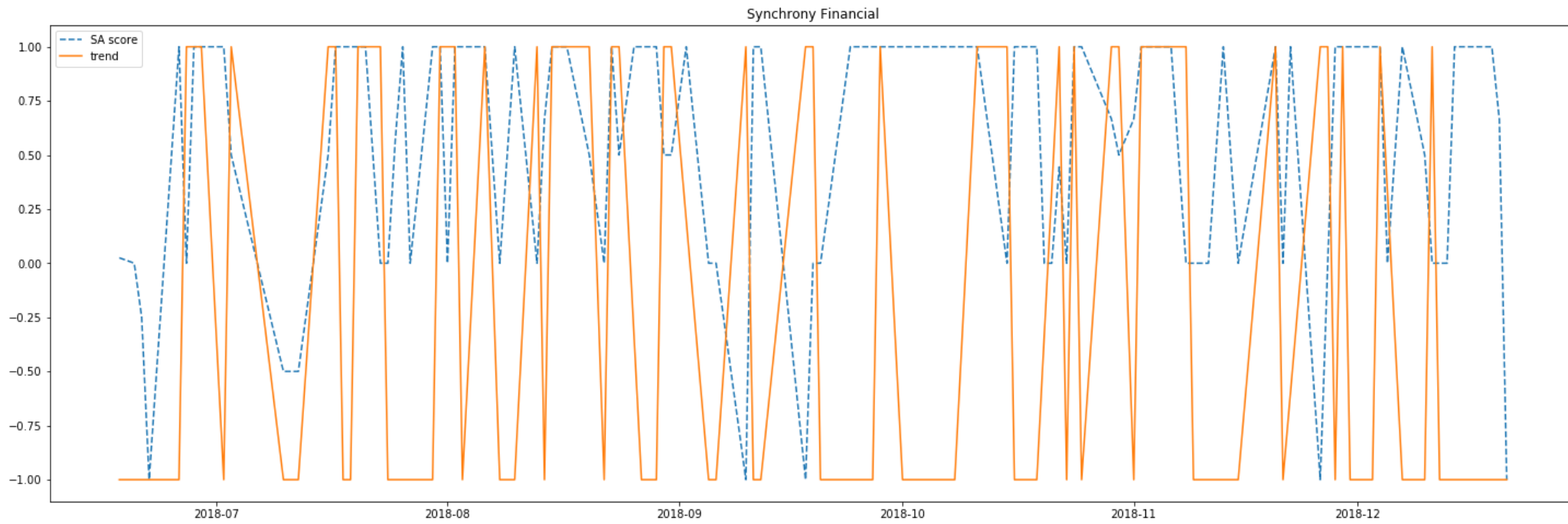
- ▶ Look at each Twitter tweet for negative or positive comments about one of the four companies
  - ▶ Negative: -1
  - ▶ Neutral: 0
  - ▶ Positive: 1
- ▶ Used the Twitter API to gather each of the posts and used TextBlob to analyze the sentiment behind the tweet



Using Twitter to gage people's feelings to the companies (3M)

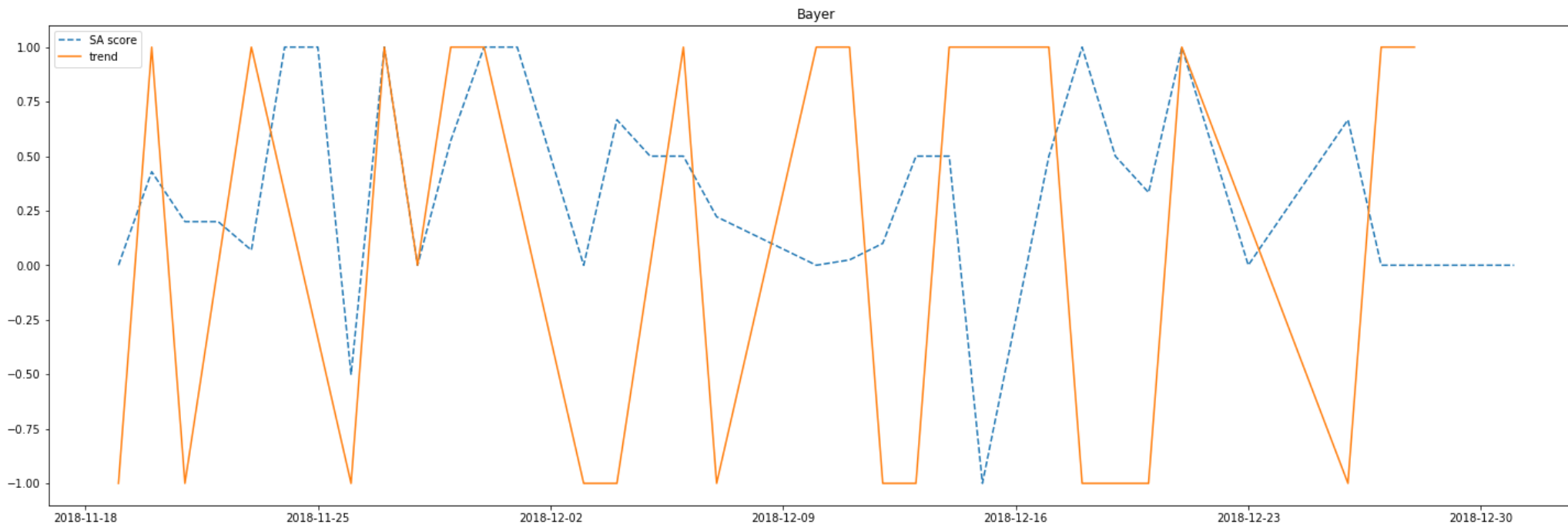


Using Twitter to gage people's feelings to the companies (Honeywell)



Using Twitter to gage people's feelings to the companies (Synchrony)





Using Twitter to gage people's feelings to the companies (Bayer)

# Summary

- ▶ It would have been smart to invest in Synchrony
- ▶ The Geometric Brownian Motion model had issues following the trends
  - ▶ If there was more time, we were thinking of using a Monte Carlo simulation to determine the best parameters for the Geometric Brownian Motion model
- ▶ There is little correlation with Tweet sentiment and stock value
  - ▶ If there was more time, we were thinking about looking for posts from company CEO's or people with a lot of followers

Questions?