A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light greenish-blue. They are positioned diagonally, with the blue one partially covering the green one.

# Predicting and Visualizing Stock Market Data

Derek VanBriesen



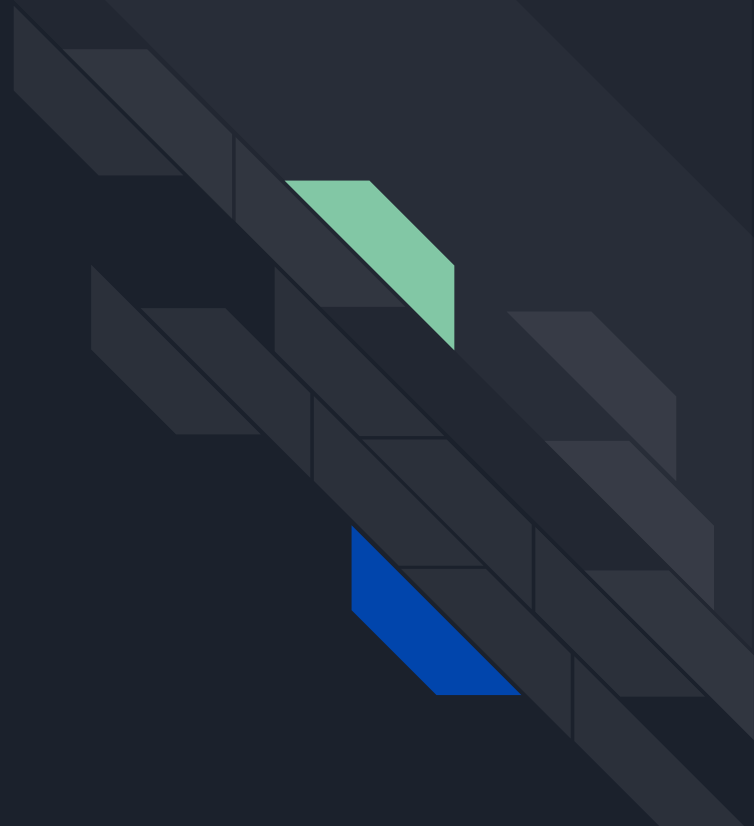
# Business Case

Create a tool that can visualize stock data

- Must be interactive
- Must use machine learning models
- Must be simple to use

# The Data

- Stock symbol lists - NYSE and NASDAQ
- Stock price history - Yahoo Finance
- Daily Yield Data - US Treasury





# Data Preparation

## Data Filtering

- Mid-cap and larger
- No recent IPOs

## New Features

- Moving average
- Yield Spreads

## New DataFrame

- Sector Indices



# Modeling

## ARIMA model

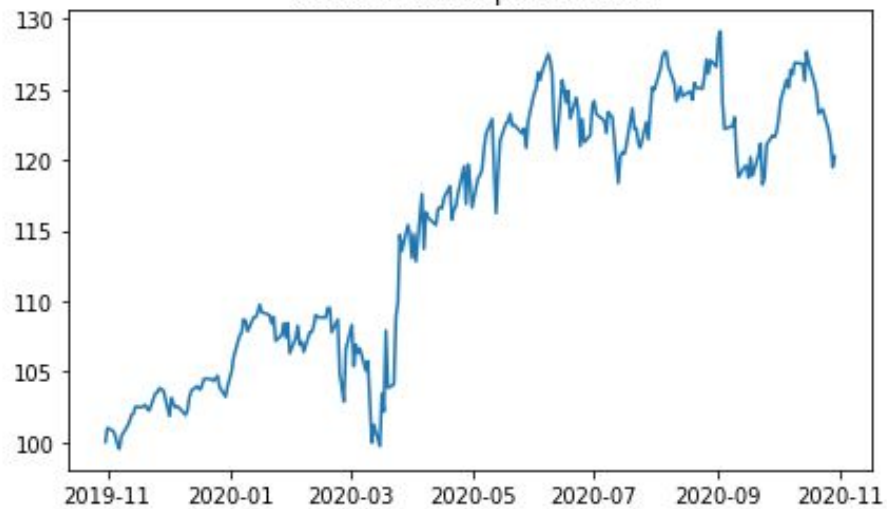
- Used Box-Jenkins Method
- Sector Averages

## LSTM

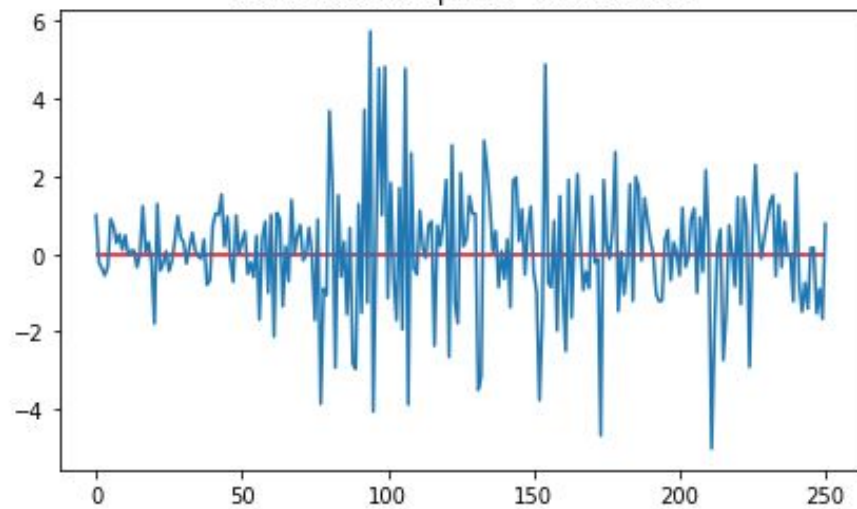
- Neural net
- Able to remember values



Tech Stock Composite Index



Tech Stock Composite - Differenced



# Evaluation

## ARIMA

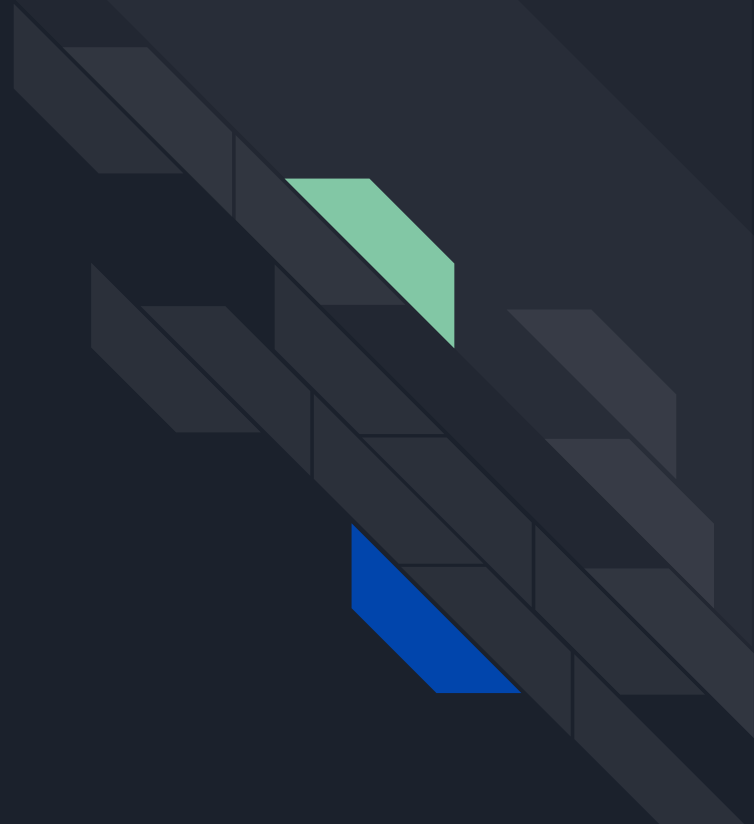
- Akaike information criterion
- MSE

## LSTM

- MSE

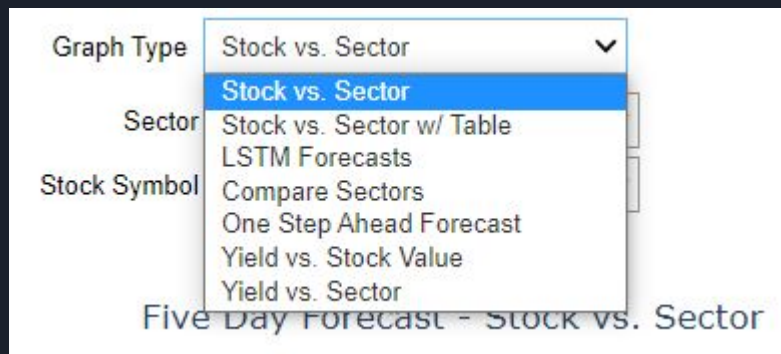
## Interface

- Does it meet the criteria?



# Deployment

- Operated using only drop-down boxes
- Multiple Chart Options
- Includes Predictions and two ML models





# Deployment

Graph Type

Sector

Stock Symbol

Five Day Forecast - Stock vs. Sector



## Sector Indices



## Yield Curve vs. Sector Index





# Future Work

- Additional plots
- Continue Tuning LSTM
- Longer time series
- Use LSTM on sector indices



# Citations

<https://finance.yahoo.com/>

<https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>

<https://old.nasdaq.com/screening/companies-by-name.aspx?letter=0&exchange=nyse&render=download>

<https://old.nasdaq.com/screening/companies-by-name.aspx?letter=0&exchange=nasdaq&render=download>



# Thank you for listening!

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