💎 🙌 Ethically Sourced

Built by Bryn, Kelly, and Michael

Objective: Interactive Stock Screener

RECOMMEND publicly traded companies that matches the user's ethical standards

FORECAST the direction of the stock of interest

What we built

Amazon Lex Bot

User interacts with bot to get recommendations and forecasts

Amazon Lambda

Process user input to provide recommendations and forecasts to bot

Azure App Service (API)

`/forecasts/{TICKER}`
Returns the forecast for specified ticker

Forecasting model

The Search for Data

Fortune Change the World List

Recognizes companies that have had a positive social impact through activities that are part of their core business strategy.

Corporate Knights Global 100 List

Produces rankings and financial product ratings based on corporate sustainability performance.

Global Impact Investing Network Trends Reports

Impact investments are investments made into companies, organizations, and funds with the intention to generate social and environmental impact alongside a financial return.

References:
Fortune. Change the World. https://fortune.com/change-the-world.
Corporate Knights. Global 100 Reports. https://www.corporateknights.com/reports/global-100.
Impact Investing Trends. https://thegiin.org/assets/GIIN_Impact%20InvestingTrends%20Report.pdf

Data Cleaning

Loading

Download CSV files and JSON data from websites.

Load each dataset into dataframe.

Convert to appropriate data types.

Historical data from Alpaca did not need additional cleaning.

Enrich

Enrich each company with stock ticker using Tradier API. Remove any companies with no matching ticker.

Categorize companies by ethical practices:

- Human rights support
- Environmentally friendly
- Unaffiliated with Defense/Weapons
- Cruelty free

Output to CSV

Concatenate dataframes into a dataframe per category.

Export dataframe to CSV file.

Data Modeling

Preprocess

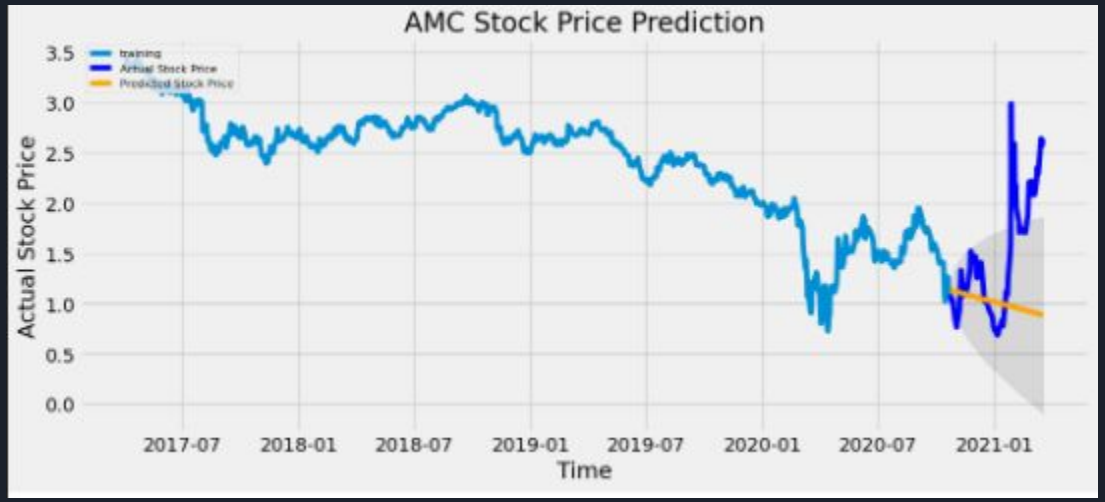
- *Call in API (Alpaca)*
- *Gets the last 1000 days of stock data.*
- *Focused on Close data*
- *Finds stationarity using Dickey-Fuller Test*

Train/Validate

- IF data is not stationary
  - Data is ran through a log() transformation
- ELSE data is trained and then ran through auto_arima()
  - This finds the best model order

Forecast

- Data is then ran through a forecast function and we output a series alongside the Mean Absolute Percentage Error



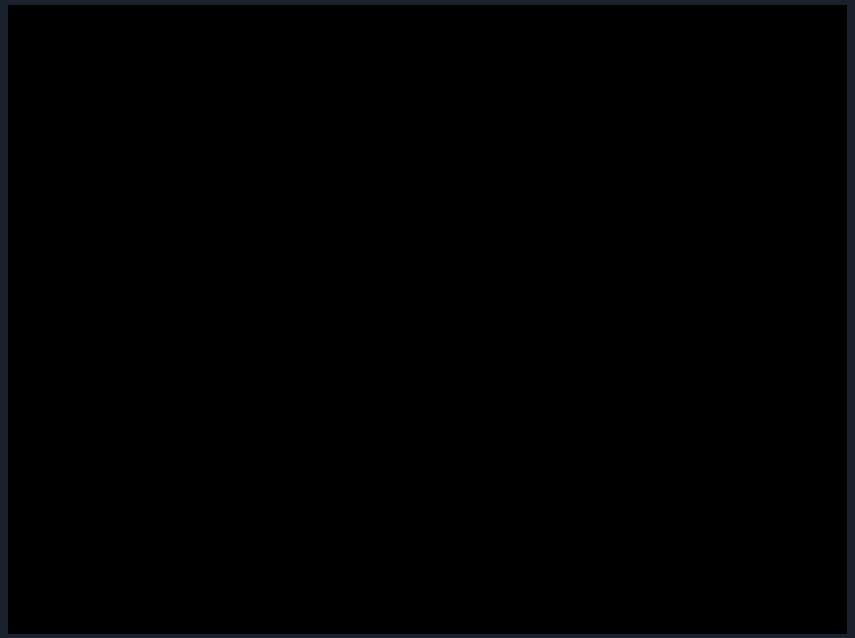

```
print(f"Model is %{100 - round(mape * 100, 2)} accurate in predicting test set observations,
based on Mean Absolute Percentage Error.")
```

```
Model is %67.45 accurate in predicting test set observations, based on Mean Absolute Percentage Error.
```

This stock was forecasted to be down over 10 trading days.

Ethos the Bot

Hi, I’m Ethos. What can I help you with today?



Postmortem

If we had more time...

- Track predictions to improve the confidence and accuracy of forecast model
- Cache results to speed up response time to bot
- Expand the company list
- Generate our own scores/metrics based on news articles (NLP, sentiment analysis), financial statements, company products, etc…
- Deploy as an Alexa skill

Questions?