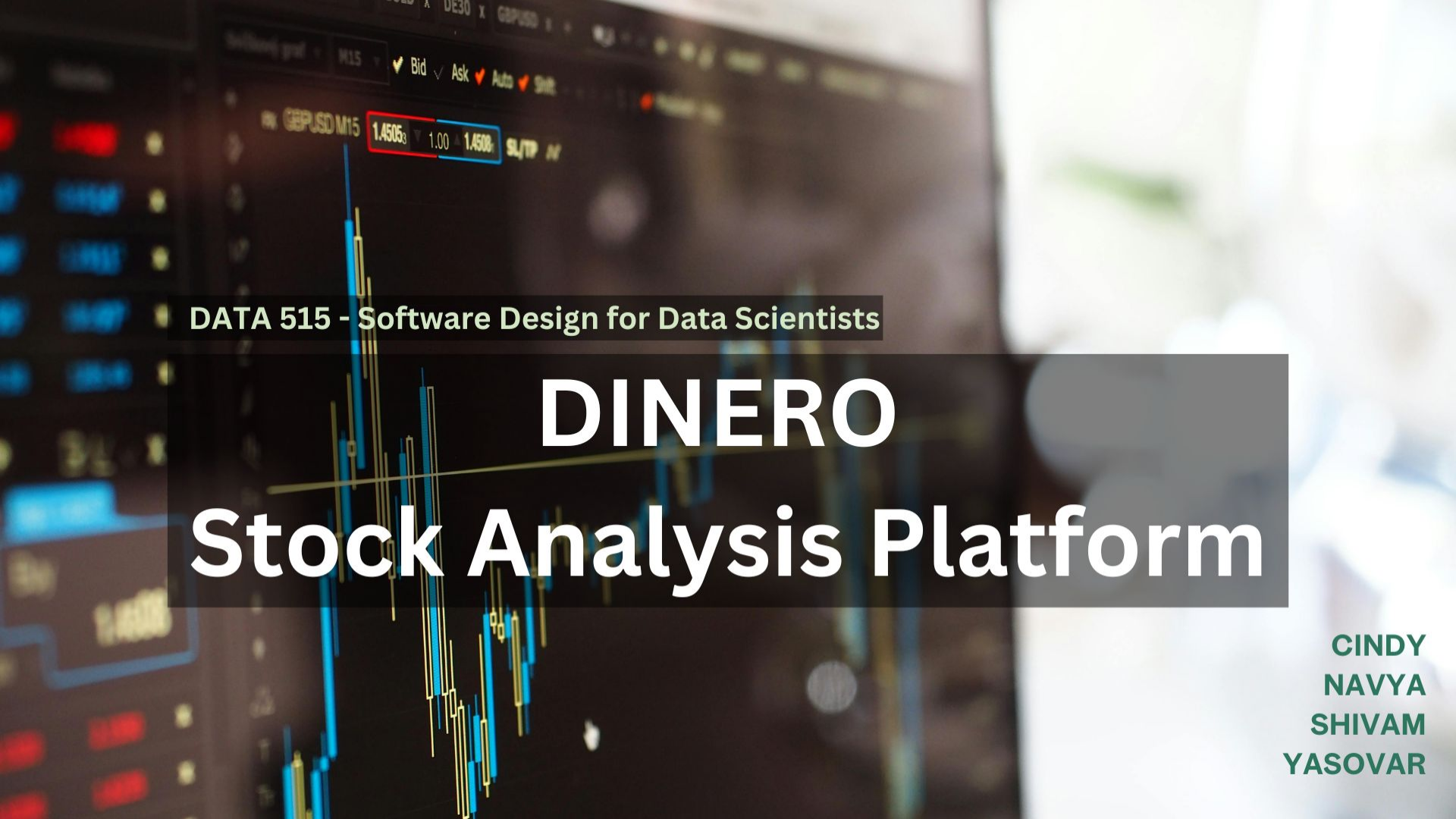

DATA 515 - Software Design for Data Scientists

DINERO
Stock Analysis Platform

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NAVYA
SHIVAM
YASOVAR

Background

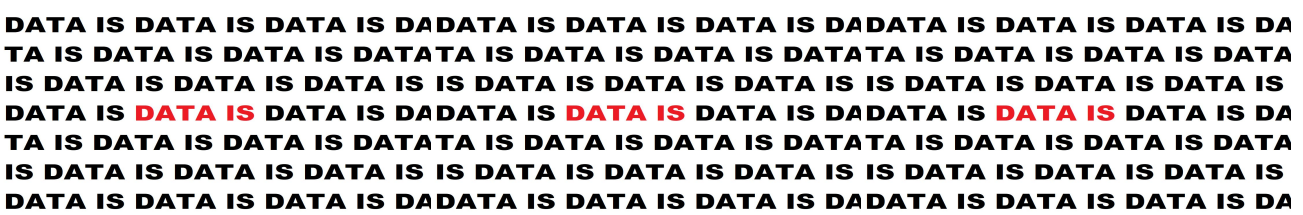
Our project aims to created a **stock analysis platform** with a focus on exploring trends of **historical stock data**, incorporating essential **technical indicators**, and displaying **news headlines/events** correlated to the sudden fluctuations in stock prices.

By leveraging a combination of **statistical analysis**, **sentiment analysis**, and **interactive visualization** techniques, the platform seeks to empower users with the information needed to make investment choices.

Previous Work

- StockSight (stock price predictor based on sentiment analysis)
- Google Finance Stock Analysis (stock data processing platform with tweets sentiment)

Dataset

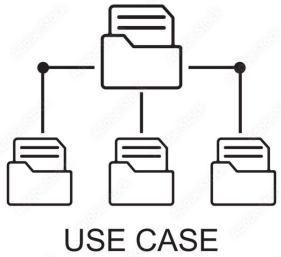


1. **Yahoo Fianance open-source API** for company **stock price** data.
   - This builds a static dataset of historical stock data from Yahoo Finance.
   - We started with five selected companies. (Apple, Google, Microsoft, NVIDIA, and Tesla.)
   - The metrics include open price, close price, volume, and adjusted price.
   - 5 years of timeframe by default.

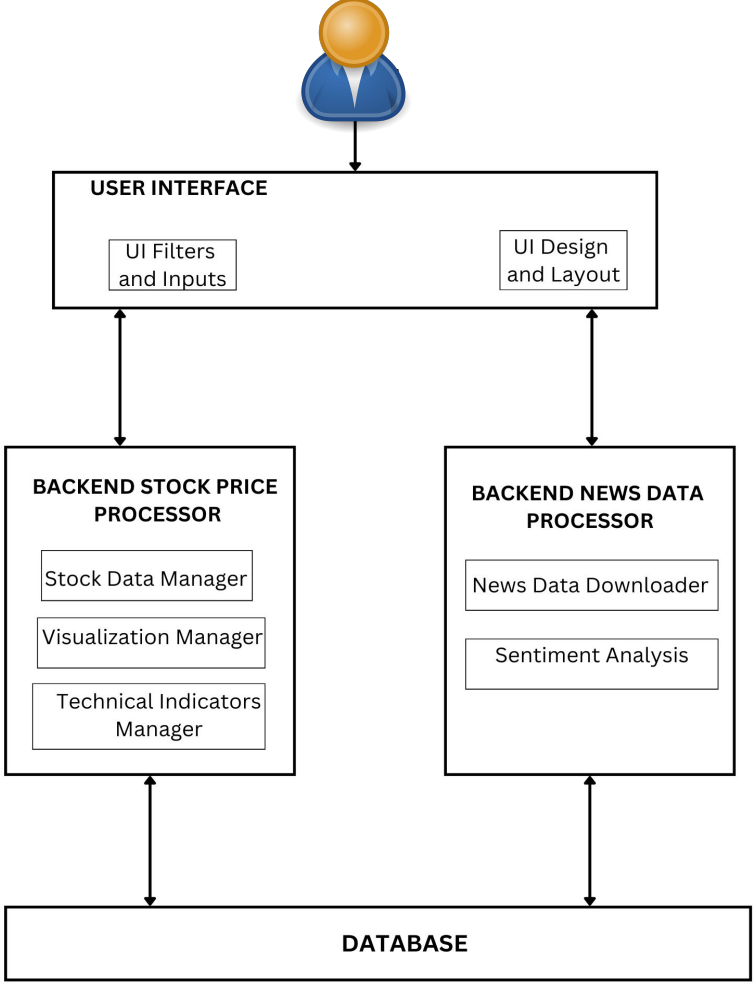
2. **EODHD API** for stock market and financial **news** data.
   - The API will be called dynamically when running sentiment analysis.
   - Each news item in this dataset will include information like title, date, content, and original URL, enabling further exploration and analysis.

Use cases

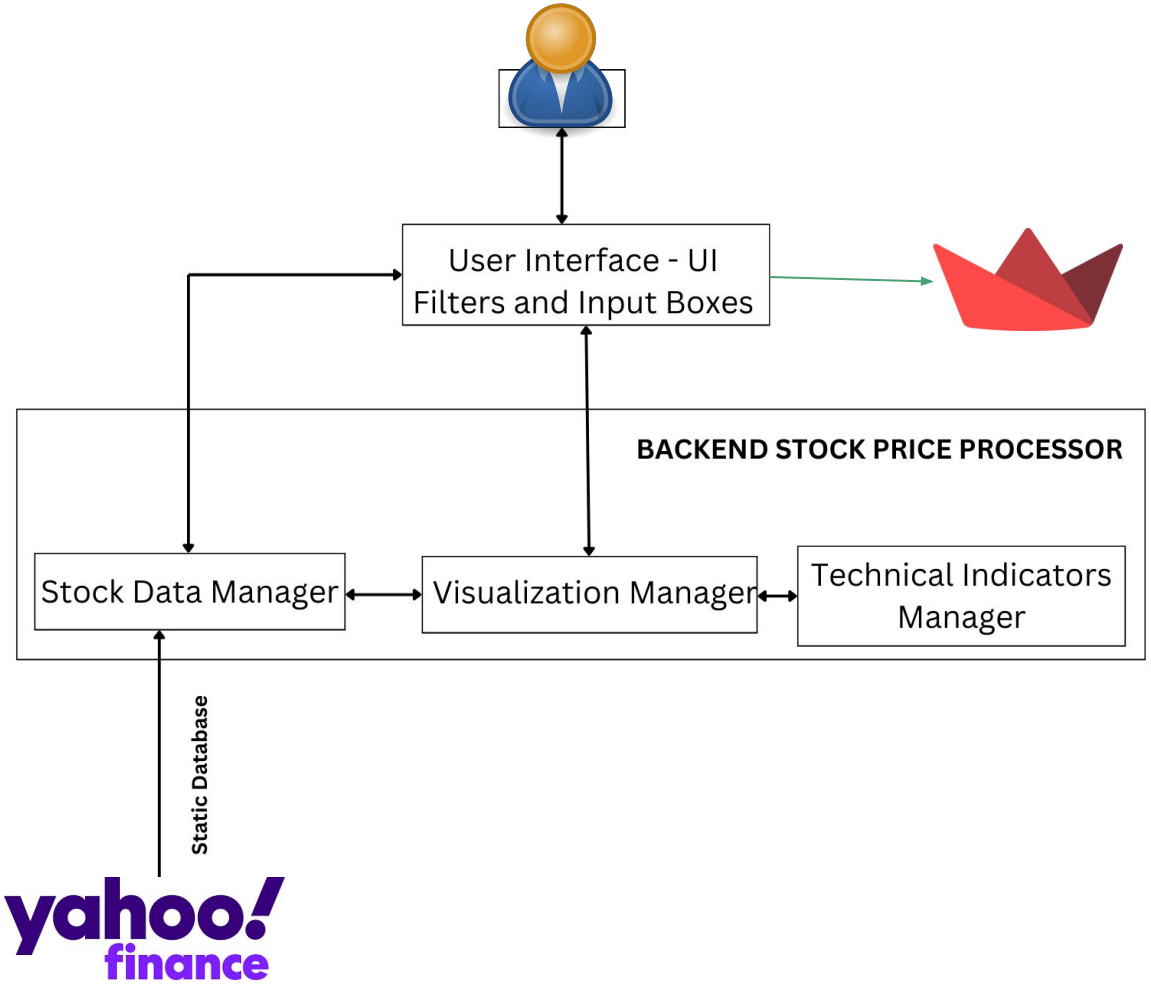
1. Viewing historic price movement of the stocks
2. Explore news pertaining to relevant events (drastic changes in the stock data)
3. Examining KPIs of interest for specific stocks
4. Understand the sentiment around the price movements



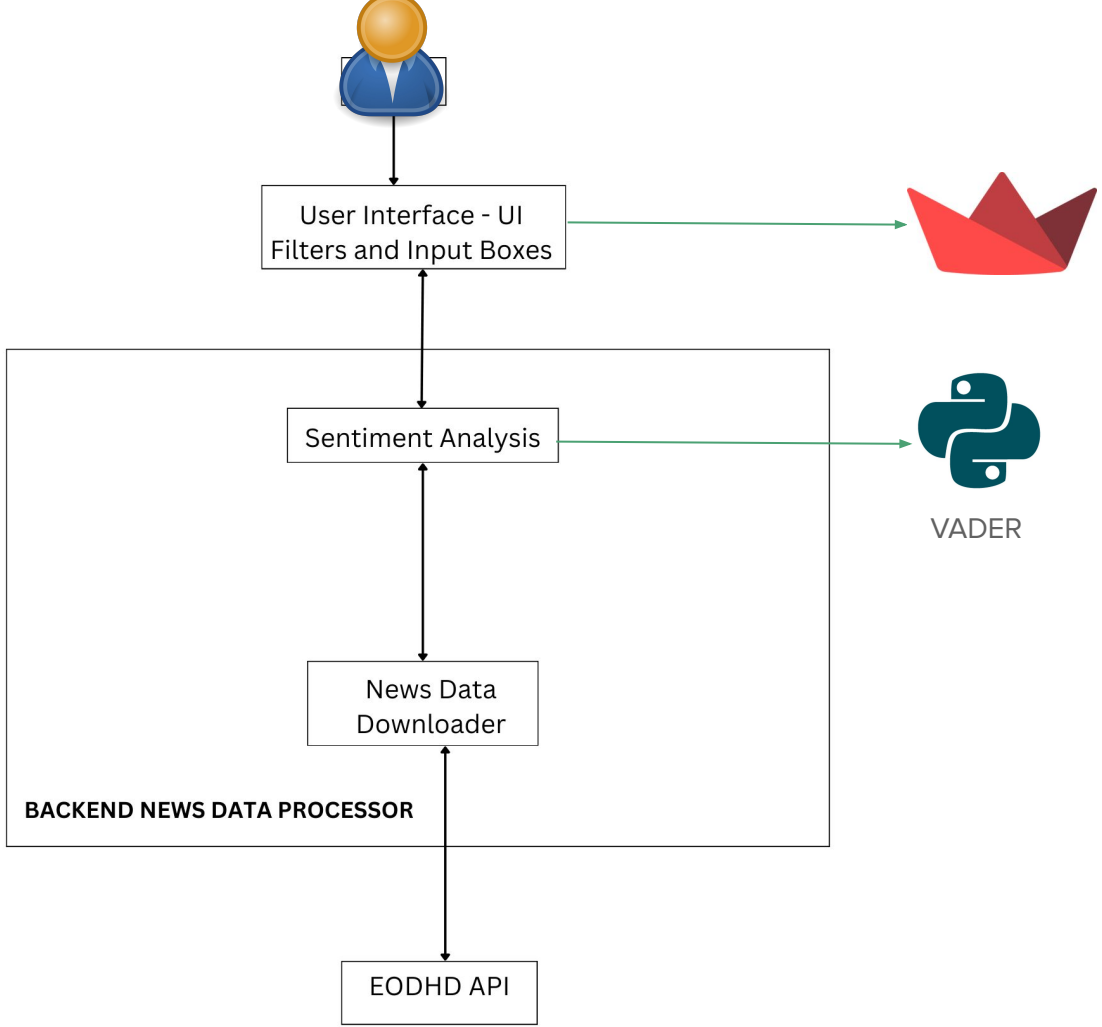
System Design



Component Design and Interaction : Graphs and Technical Indicators



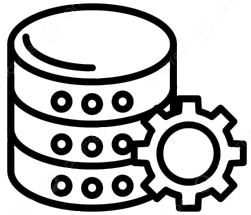
Component Design and Interaction : Sentiment Analysis



Demo

Video Link - GDrive

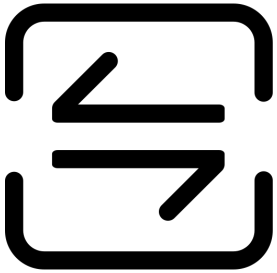
Lessons Learned

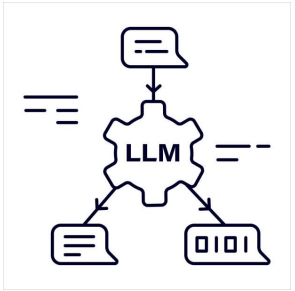


- Importance of efficient data management to optimize quick retrieval of data, particularly in handling and visualizing complex datasets.

- A key takeaway was the need for robust error handling, especially when dealing with external API calls and user inputs, ensuring the system's reliability and stability.

Future Work

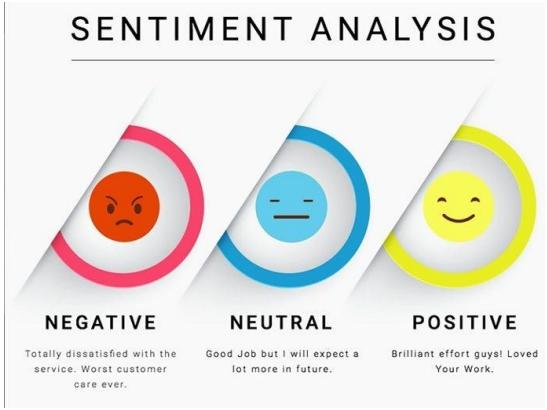




- Expanding the data manager's capabilities to handle real-time data for dynamic updates.
- Incorporating advanced plots with callbacks and indicator overlays to enhance user experience and overcome the drawbacks of Plotly.
- Providing summaries of extensive news articles using LLMs.
- Assessing news sources by assigning a credibility score to distinguish between reliable information and spam in stock market articles.

Questions ?

Technologies Used



Language Used:

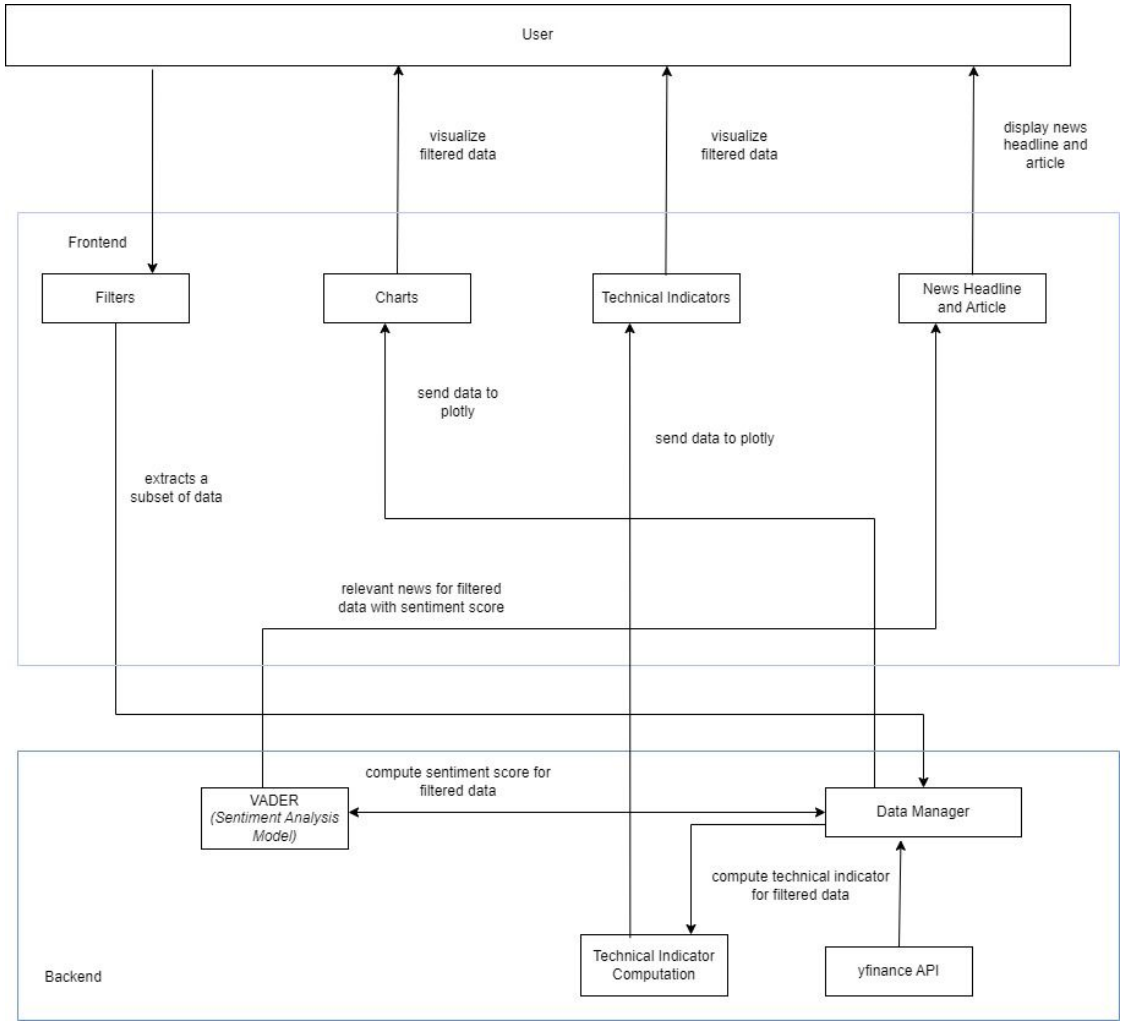
- Python

Libraries Used:

- VADER for Sentiment Analysis
- Streamlit for the User Interface
- Plotly graphs for visualization

API Used:

- EODHD API
- Yahoo Fianance open-source API


User
visualize filtered data
visualize filtered data
display news headline and article
Frontend
Filters
Charts
Technical Indicators
News Headline and Article
send data to plotly
send data to plotly
extracts a subset of data
relevant news for filtered data with sentiment score
compute sentiment score for filtered data
VADER (Sentiment Analysis Model)
Data Manager
compute technical indicator for filtered data
Technical Indicator Computation
yfinance API
Backend