Project04: Makers Makin' It, Act II -- The Seequel
TNPG: PretendingGreatness
Roster: Michelle Zhu (PM), Victor Casado, Mark Ma, Jessica Yu
TARGET SHIP DATE: 2025-04-20

P04 DESIGN DOCUMENT

Description
This project implements a web application that incorporates data visualization to identify interesting patterns and correlations between Elon Musk's tweets and Tesla stock market prices.

- Users can register to use the site
- A logged-in user will be able to
    - View their name at the top of every web page
    - Access all functionalities
- A non-logged-in user will be able to:
    - Access all functionalities

Datasets

A. Elon Musk's Tweets from 2010 to 2025 (Kaggle)
https://www.kaggle.com/datasets/dadalyndell/elon-musk-tweets-2010-to-2025-march

B. Tesla Stocks Dataset (Kaggle)
https://www.kaggle.com/datasets/iamtanmayshukla/tesla-stocks-dataset

API

A. Google Gemini API
We are using the Google Gemini API to assist in providing tweets analysis.

Functionalities

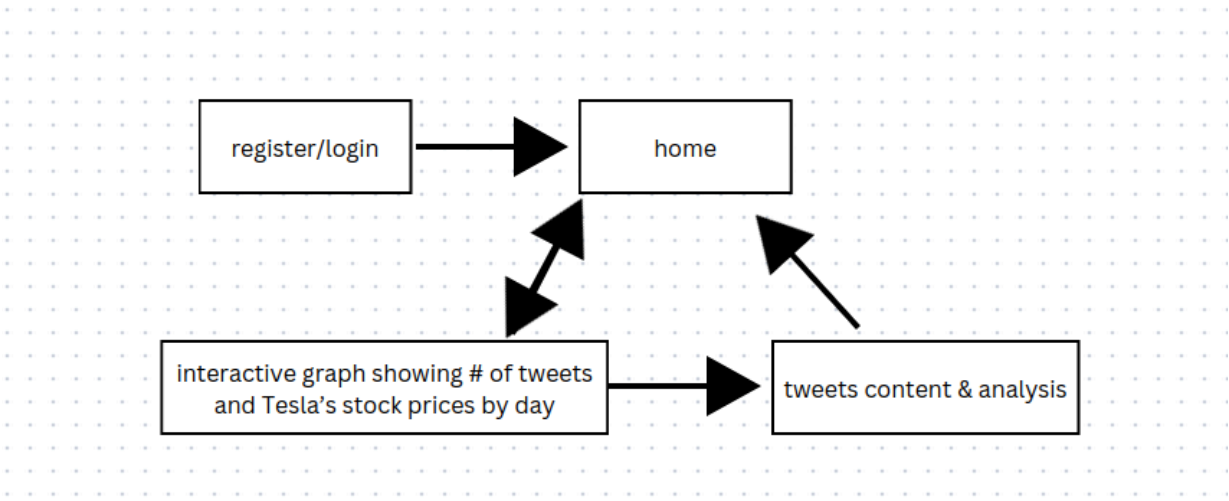
- ☐ Scatterplots of tweets (number of tweets made/number of likes or comments) and $TSLA stock prices by day

- ☐ Clicking on a specific data point redirects user to another page showing the tweet content
- ☐ A heatmap of tweets
- ☐ AI tweet analysis
    - Gemini will be used to predict whether it is likely that Tesla stocks will go up/down given the tweet. We will compare this to the actual stock direction.

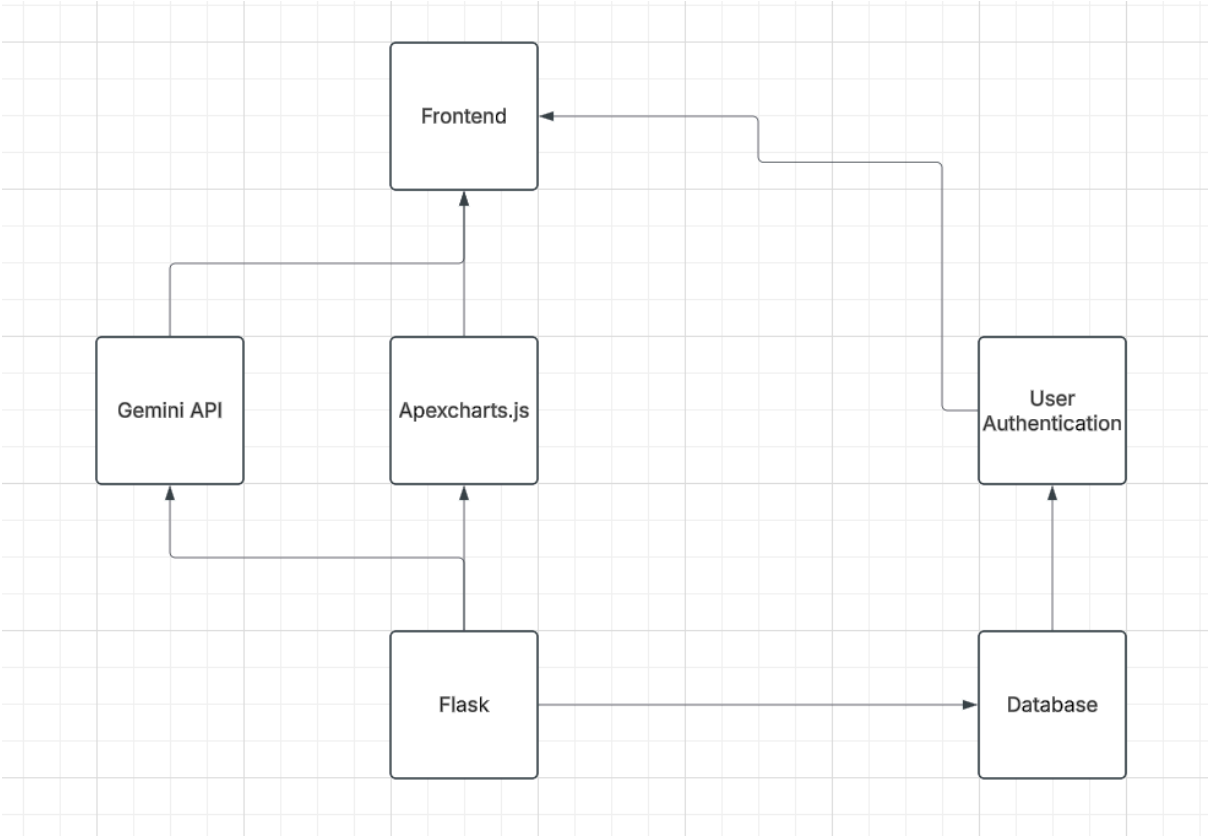
Program Components

1. Flask/Python:
    a. Serves the websites, handles HTTP requests, authentication (login), controls logic surrounding permissions
    b. Interacts with tables within the database file to fetch and store user data
    c. Coordinates Flask routes (between HTML pages) and middleware functions (ex. module for storing data into tables) to control application flow
2. SQLite3:
    a. Stores user information (usernames, passwords, permissions, etc)
    b. Data used by middleware functions and HTML templates
3. HTML:
    a. Maintains frontend structure
    b. Renders content passed by Flask routes/database
    c. Displays form for user interactions and works with Python to create the various actions
4. CSS (Bootstrap):
    a. Adds styling
5. ApexCharts.js:
    a. Presents visually appealing data visualizations
    b. Adds interactivity for users

Site Map



Component Map



Database Organization

1. Register/login Information
    a. Username
    b. Password

SQL Database:

Username	Password
Topher	Mykloyk
abc	def

Task Breakdown

1. Michelle Zhu: Full-stack/Project Lead
    a. Implement user authentication system and sessions
    b. Work with backend and frontend to make sure everything works smoothly
    c. Assist with everything:
        i. Implement charts with apexcharts.js
        ii. Create HTML pages with basic structure
        iii. Implement backend
2. Victor Casado: Backend
    a. Create SQLite3 database schema
    b. Implement charts with apexcharts.js
    c. Implement AI to integrate sentiment analysis with dataset analysis (i.e. use AI to predict the trend of the Tesla Stock given Elon Musk's tweets)
    d. Create and organize python modules to handle logic
3. Mark Ma: APIs
    a. Incorporate Gemini API
    b. Implement graphing with apexcharts.js and dataset relationship analysis
    c. Integrate Flask with JS
4. Jessica Yu: Frontend
    a. Create HTML pages with basic structure
    b. Implement charts with apexcharts.js
    c. Use Bootstrap to make things look nice
    d. Collaborate with the backend to ensure everything works with the frontend