Portfolio Tracker Website

Abstraction

The Portfolio Tracker Website allows users to track their stock investments effectively. Users can manage their stock portfolio, view real-time stock prices, and calculate their portfolio value.
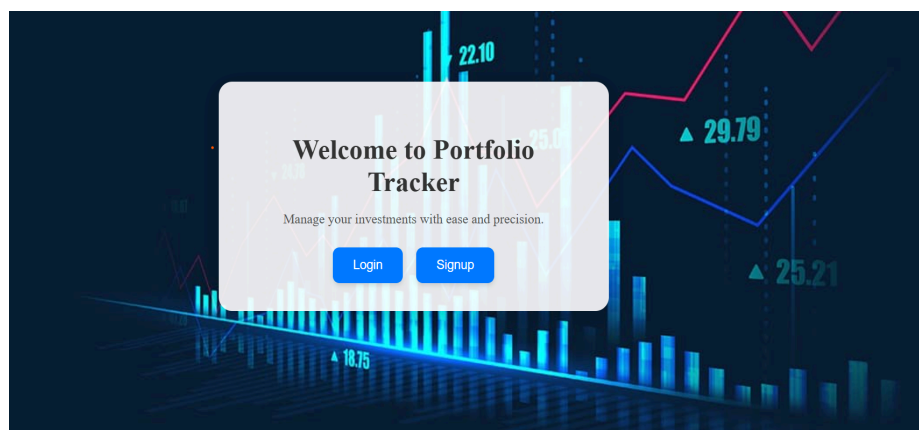
Technologies Used : Technologies which I used in this website includes

- React for frontend

- Spring Boot for backend

- MySQL database for storing the user data and stocks data

Below are the key features and functionalities of the website.
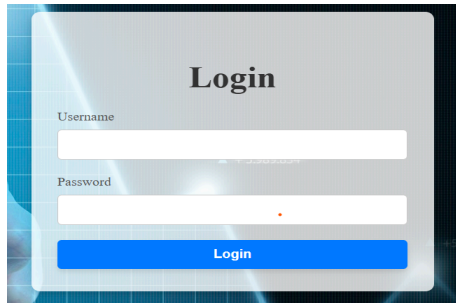
Landing Page

- The first page users encounter upon accessing the website.

- Two options are available:
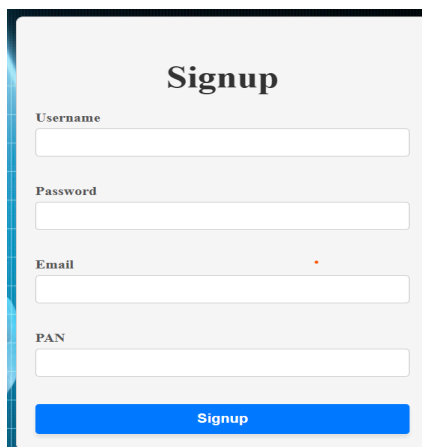
    1. Login

    2. Signup

User Authentication

Login and Signup Page

- **Login**: Users with an existing account can log in by providing their **username** and **password**.

- **Signup**: Users without an account can register by providing the following details:

  - **Username** (Should not have the space)

  - **Password** (Stored in database in the encrypted form)

  - **Email** (Must follow a valid email format)

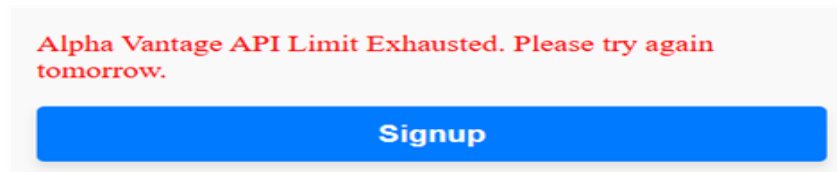 - **PAN Number** (Must be a 10-digit alphanumeric value)

5 unique stocks are randomly allocated to the user after successful signup.

- **Transactional System**: If any error occurs during the signup or login process, the action will be rolled back to ensure data integrity.

Post-Login Features

Usage Limit Notification

- If the user's API call limit is exhausted, they will see a notification: **"Your limit has been exhausted."**

Alpha Vantage API Limit Exhausted. Please try again tomorrow.

Signup

First Login of the Day

- When the user logs in for the first time in a day, data will be fetched from the API, and the stock prices for the current day will be displayed.

- On subsequent logins during the same day, the value will be fetched from the database.

Real-Time Data Updates

- If the date changes, the system automatically fetches the latest stock prices and updates them in real time.

Caching System

- To optimize API usage:

    - If a user calls an API for a specific stock ticker, the data is stored in cache.

    - If another user requests data for the same ticker on the same day, it will be retrieved directly from the cache to minimize the API calls. Because stock price value changes everyday.

API and Data Fetching

- Real-time stock price updates through API calls.
- Data fetch happens only once per user per day, with subsequent updates triggered by date changes.
- Caching mechanism to reduce redundant API calls by storing and reusing data for the same ticker.

User Holdings

Adding and Removing Stocks

- **Add Stock**: Users can add stocks to their portfolio by clicking the **Add Stock** button.

    ○ **Buy Price Constraint**: Users cannot add a stock without entering the **Buy Price**.

    ○ If the same stock is already present on the same day, the quantity of the stock will increase as much stock added.

- **Remove Stock**: Users can remove stocks from their portfolio.

    ○ If the stock is removed, the quantity decreases as much stock is removed.

Calculate Portfolio Value: Displays the total portfolio value based on the current holdings and their respective real-time prices.

Portfolio Value Calculation

- The total portfolio value is calculated as follows:

$$\text{Portfolio Value} = \sum (\text{Real-Time Price} \times \text{Quantity})$$

- This calculation updates automatically when stock prices are fetched or when quantities change.

Dashboard

- The dashboard displays all details related to the user's account.

  User Details: Displays the **PAN Number**, **User ID**, and **Email**.

  View Current Holdings: Displays the list of stocks currently held by the user.

Dashboard

Username: Test
Email: test@gmail.com
PAN: VFCTGBG667

Your Holdings

Stock	Ticker	Quantity	Buy Price	Realtime Price	Total Value
Hindustan Unilever Ltd	HINDUNILVR.BSE	1	2340.3999	2340.3999	2340.40
Reliance	RELIANCE.BSE	1	1272.95	1272.95	1272.95
Zomato	ZOMATO.BSE	1	214.65	214.65	214.65
Infosys	INFY.BSE	1	1799.8	1799.8	1799.80
Bajaj Finance	BAJFINANCE.BSE	1	7287.0498	7287.0498	7287.05

Error Handling and Data Integrity

- **Transactional System**: The website uses a transactional system to ensure data integrity. If any issue occurs during a signup, login, or data update operation, the changes will be rolled back.

- **Error Messages**: Clear error messages displayed to the user, such as invalid PAN number or email format errors.

- **API Limit Handling**: Users will be notified when their API usage limit is exceeded, ensuring seamless user experience.

Additional Constraint

1. Real-time data updates are triggered only on the first login of the day or when the date changes.

2. Limits for API calls and user-specific actions are monitored; users are notified when limits are exhausted.

3. The application ensures secure handling of user credentials and sensitive data, including PAN numbers.

Summary

This portfolio tracker website is designed to provide an efficient, real-time, and user-friendly experience for stock tracking. By leveraging caching, API optimizations, and transactional mechanisms, it ensures accurate data management and seamless functionality for all users.

Disclaimer

Because of the use of a free server, it may be possible that there is a potential delay in the signup and login processes.