Real-Time Analysis of Stock Market Segment

Submitted in partial fulfillment of the requirements of

PG-DIPLOMA IN BIG DATA ANALYTICS

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CERTIFICATE

This is to certify that the project entitled "**Real-Time Analysis of Stock Market Segment**" is a teamwork work of **"Neha Fadke (230310125012), Rushikesh Patil (230310125015), Gyaneshwari Deshmukh (230310125006)."** Submitted to ACTS, C-DAC, New Delhi in partial fulfillment of the requirement for the PG- Diploma in Big Data Analytics.

Mr. Sunil Kumar

(Senior Project Engineer, C-DAC, ACTS, New Delhi)

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Date: 04/09/2023

ABSTRACT

In an increasingly interconnected and data-driven world, understanding and navigating the complexities of the stock market is a vital skill. Our project, the Real-Time Analysis of Stock Market Segment, leverages the Alpha Vantage API, alongside JavaScript and HTML technologies, to provide an accessible and empowering solution. This platform offers users the ability to access, visualize, and analyze real-time stock market data effortlessly. Users can select their preferred stocks, visualize technical indicators, and download the data, all within an intuitive and user-friendly interface. Additionally, the platform facilitates informed decision-making by enabling users to download data for further analysis. With a focus on data accuracy, user guidance, and continuous improvement, our platform aims to democratize financial literacy and empower users to make sound investment decisions in an ever-evolving market. This project represents a commitment to financial education and accessibility, bridging the gap between novice investors and the dynamic world of stock trading

1. INTRODUCTION

In today's interconnected and data-driven world, the stock market remains a focal point for individuals seeking financial growth and investment opportunities. However, the complexity of stock trading, investment strategies, and market dynamics can be overwhelming for newcomers. To bridge this knowledge gap and provide a transformative learning experience, we propose the development of a cutting-edge Real-Time Analysis of Stock Market Segment Platform.

This innovative platform harnesses the power of modern technologies, including APIs, JavaScript, and HTML, to offer a dynamic and immersive educational journey. Its primary mission is to empower novice learners with the essential knowledge and skills required to navigate the intricate world of stock trading. By delivering real-time data visualization, educational content, and interactive tools, the platform aims to demystify the stock market and instill confidence in users, whether they are budding investors or individuals simply seeking to understand financial markets better.

In this project, we will explore the Real-Time access of stock data, visualization feature scope, advantages, and potential applications of this Real-Time Analysis of Stock Market Segment Platform. By providing users with a visually engaging and intuitive interface, we aim to foster a community of informed and empowered individuals ready to make sound investment decisions and navigate the complexities of the financial world. This platform represents not only an educational resource but also a tool for financial literacy and empowerment in an increasingly interconnected global economy.

2. DESCRIPTION

In an era where financial markets are more accessible than ever, individuals are increasingly interested in understanding and analyzing real-time stock data for informed decision-making. This project aims to create a user-friendly web application that allows users to access and visualize real-time stock market data of their preferred stocks. Additionally, users will have the option to download this data in CSV format for further analysis and record-keeping. Leveraging the power of APIs, JavaScript, and HTML technologies, this platform offers a seamless and intuitive experience for users seeking to gain insights into stock market dynamics.

Key Features:

- User Authentication and Registration:
  Users can create accounts and log in to the platform to access personalized features and save their preferences.
- Stock Selection and Real-Time Data Retrieval:
  Upon logging in, users can select and add their choice of stocks to their watch list. The platform will utilize stock market data APIs to fetch real-time data (e.g., stock price, volume, market cap) for the selected stocks.
- Interactive Graphical Representation:
  Users can visualize the real-time stock data using interactive charts (e.g., line charts, candlestick charts) that dynamically update as new data arrives. Charting libraries like Chart.js or D3.js can be employed to create visually engaging representations of the stock data.
- Data Download in CSV Format:
  Users have the option to download the real-time stock data they are viewing in CSV format, enabling further analysis or record-keeping.

3. SCOPE

The scope of our Real-Time Analysis of Stock Market Segment project is to create a dynamic web-based application that empowers users to engage with real-time stock market data in a seamless and informative manner. This platform will provide a secure user authentication system, allowing individuals to register accounts, log in securely, and manage their profiles. Users will have the flexibility to select and monitor their preferred stocks by creating and managing watch lists. The platform will harness the power of stock market data APIs to fetch up-to-the-minute information, including stock prices, trading volumes, and market capitalization, for the selected stocks. The core feature of the platform lies in its interactive data visualization capabilities, enabling users to gain insights into stock market trends through visually engaging charts, such as line charts and candlestick charts, which update in real time. Furthermore, users will have the option to download the viewed stock data in CSV format for in-depth analysis or record-keeping. Customization options will allow users to tailor their dashboard layouts and data metrics according to their preferences. To keep users informed, the platform will support price alert notifications, with configurable thresholds and notification preferences. A robust support and documentation system will ensure users can navigate the platform effectively, with user-friendly resources and tutorials. The technological stack will comprise APIs for data retrieval, client-side scripting using JavaScript for dynamic updates, and HTML/CSS for the user interface. Rigorous testing, scalability considerations, and ongoing maintenance will be integral to the project's success, ensuring the platform delivers a valuable, reliable, and user-friendly experience for individuals interested in understanding and analyzing real-time stock market data.

4. SYSTEM REQUIREMENTS

4.1. Hardware Requirements:

- Processor: Intel Core i3 and above
- Disk Space 5 GB Minimum
- RAM: 2 GB or more

4.2. Software Requirements

- Client on Internet: Web Browser, Operating System (any).
- Internet Connection: (any).
- Web Server: XAMPP, Operating System (any).
- Development End: ECLIPSE, VS Code, OS (Windows).

4.3. Technologies used

- **Public API (Alpha Vantage**): This API returns raw (as-traded) daily time series (date, daily open, daily high, daily low, daily close, daily volume) of the global equity specified, covering 20+ years of historical data
- **JavaScript:** JavaScript is the programming language of the Web used for API
- **HTML:** HTML is the standard markup language for Web pages
- **XAMPP:** XAMPP is simply a local host or server that is used to test clients or websites before publishing them to a remote web server. The XAMPP server software on a local computer provides an appropriate environment for testing MYSQL, PHP, Apache, and Perl projects.

4.4. Installation dependencies and set up of project

1. Install XAMPP server and install
2. Start first 3 tab MYSQL and apache and FILEZILLA
3. Create database with name "trading"
4. Create table with following script:

CREATE TABLE users (id int(11) NOT NULL AUTO_INCREMENT, fname varchar(255) DEFAULT NULL, lname varchar(255) DEFAULT NULL, username varchar(300) DEFAULT NULL, email varchar(300) DEFAULT NULL, password varchar(300) DEFAULT NULL, date date NOT NULL, image varchar(100) DEFAULT NULL, PRIMARY KEY (id));

5. Store all the files in xampp/htdocs/projectname
6. To run open chrome and add localhost/projectname/filename

5. SYSTEM ANALYSIS

5.1. Functional Requirements

Login of User:

- The user will be able to create his/her account.
- The admin will be able to choose stocks of its own and download stocks data of last 45 days
- The system will be able to maintain the records of user.

5.2. Non-functional Requirements:

Those requirements which are not the functionalities of a system but are the characteristics of the system are called non-functional requirements.

- Secure access of confidential data with the use of encryptions.
- Full time available.
- Data Consistency.
- Data Reliability.
- Better component design to get better performance at peak time.
- Flexible service based on architecture will be highly desirable for future extensions.

6. TECHNICAL ANALYSIS

Implementing technical analysis using the Alpha Vantage API involves utilizing Alpha Vantage's extensive data sets and analytical tools to generate various technical indicators and charts for stocks.

The Alpha Vantage API is a method to obtain historical and real-time data for several markets. You can access the data directly in Python or any other programming language of your choosing. From there, you can manipulate the data or store it for later use.

Here's an outline of how you can incorporate technical analysis into your Real-Time Analysis of Stock Market Segment Platform using the Alpha Vantage API:

1. API Integration:

Begin by signing up for an Alpha Vantage API key, which is required to access their data and tools. Integrate the Alpha Vantage API into your platform. You can make API requests using JavaScript's fetch or other relevant methods.

2. Fetching Real-Time Data:

Use the API to fetch real-time stock data for the selected stocks. This data typically includes real-time stock prices, trading volume, and other relevant information.

3. Historical Data Retrieval:

To perform technical analysis effectively, we will also need historical stock price data. Alpha Vantage provides historical data for various timeframes (daily, weekly, monthly).

4. Charting:

Integrate a charting library like Chart.js or D3.js into your platform to visualize the technical indicators. These libraries allow you to create interactive and visually appealing charts. Plot the calculated technical indicators on the charts, making them accessible and user-friendly

5. Data Export:

Enable users to export technical analysis data, including charts and indicator values, in a downloadable format, such as CSV or PDF.

7. WORKFLOW DIAGRAM

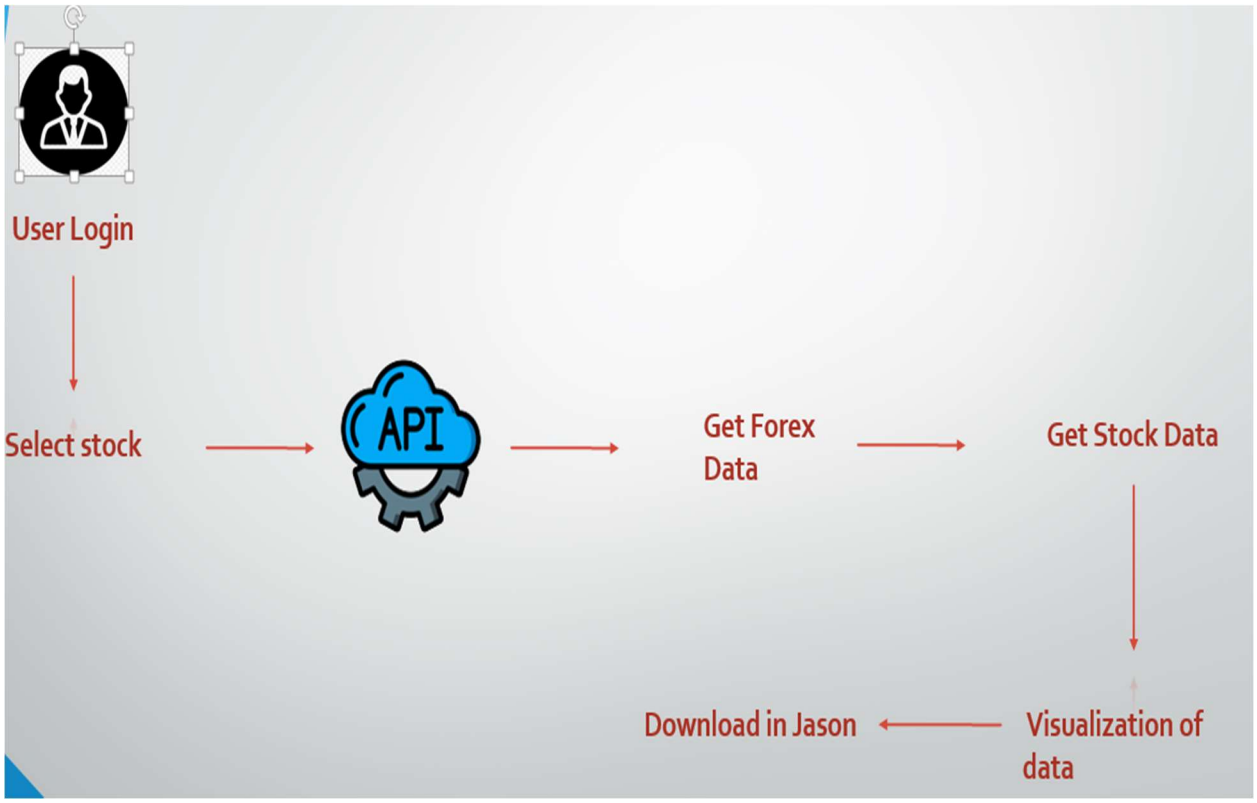


Fig.7.1. API Workflow

In fig.7.1. shows workflow of Alpha Vantage API (Public). As user login he/she has to select the stock name with id which will be display. Then the API function called i.e. get data. The data will be visualize in form of line graph and ready to be download

8. USE CASE DIAGRAM

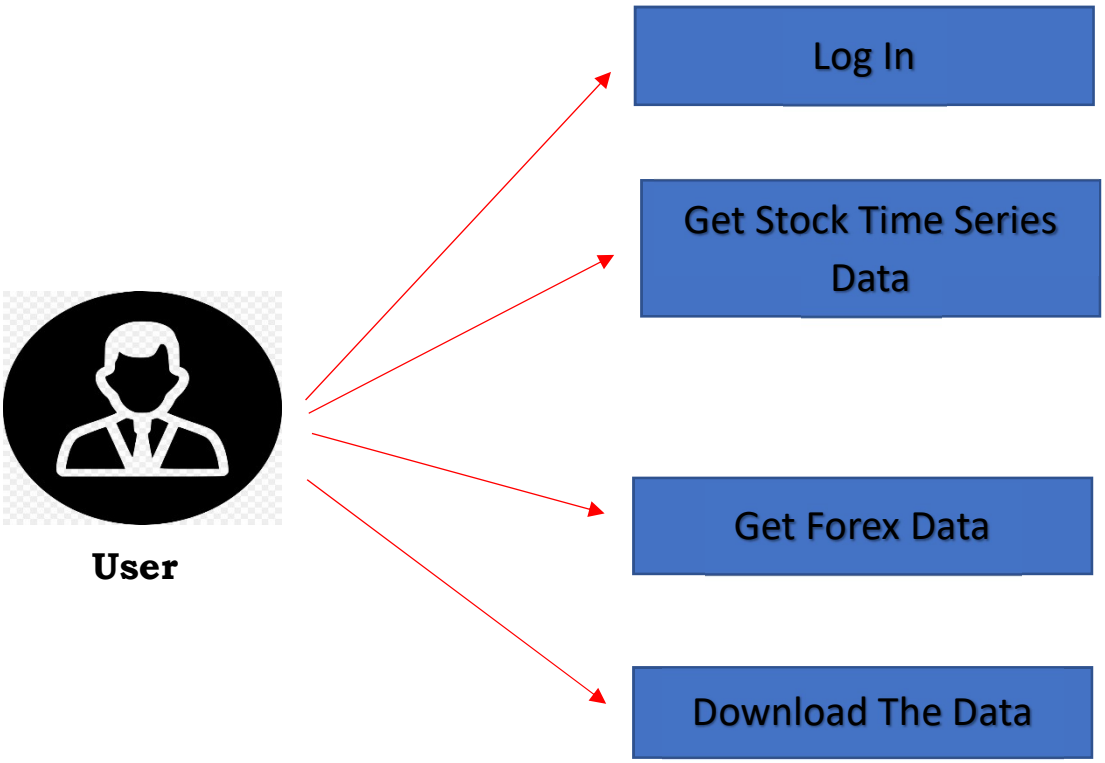


Fig.8.1. User use case diagram

Fig.8.1. shows the user use case which our project involves. User will get more connected towards the platform by this use cases.

9. USER INTERFACE DESIGN

9.1. Login Page:

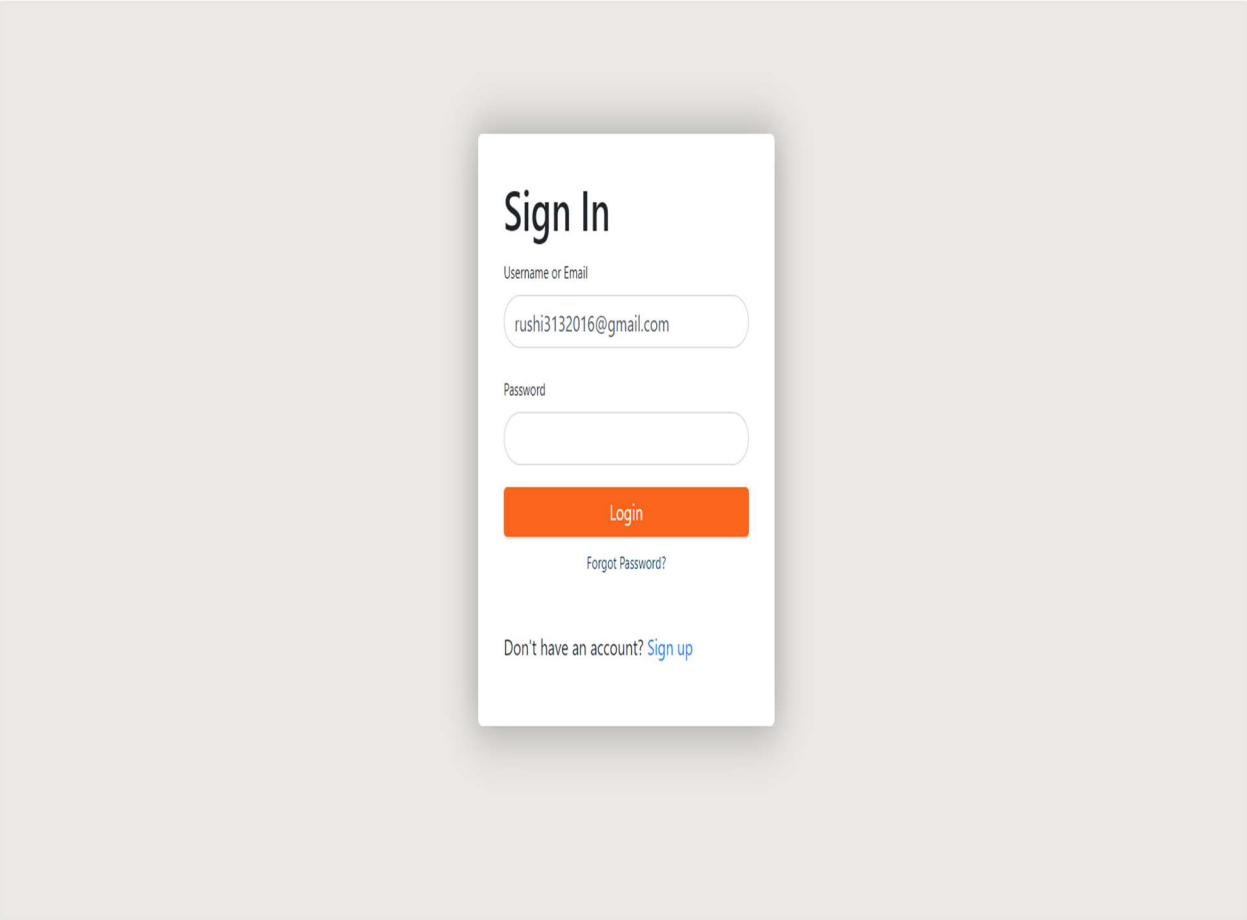


Fig.9.1. Login Page

The login page consist of user email address and password. First user has to click on ‘signup now’ if he does not have any account. It will make the platform secure.

9.2. Sign Up Page:

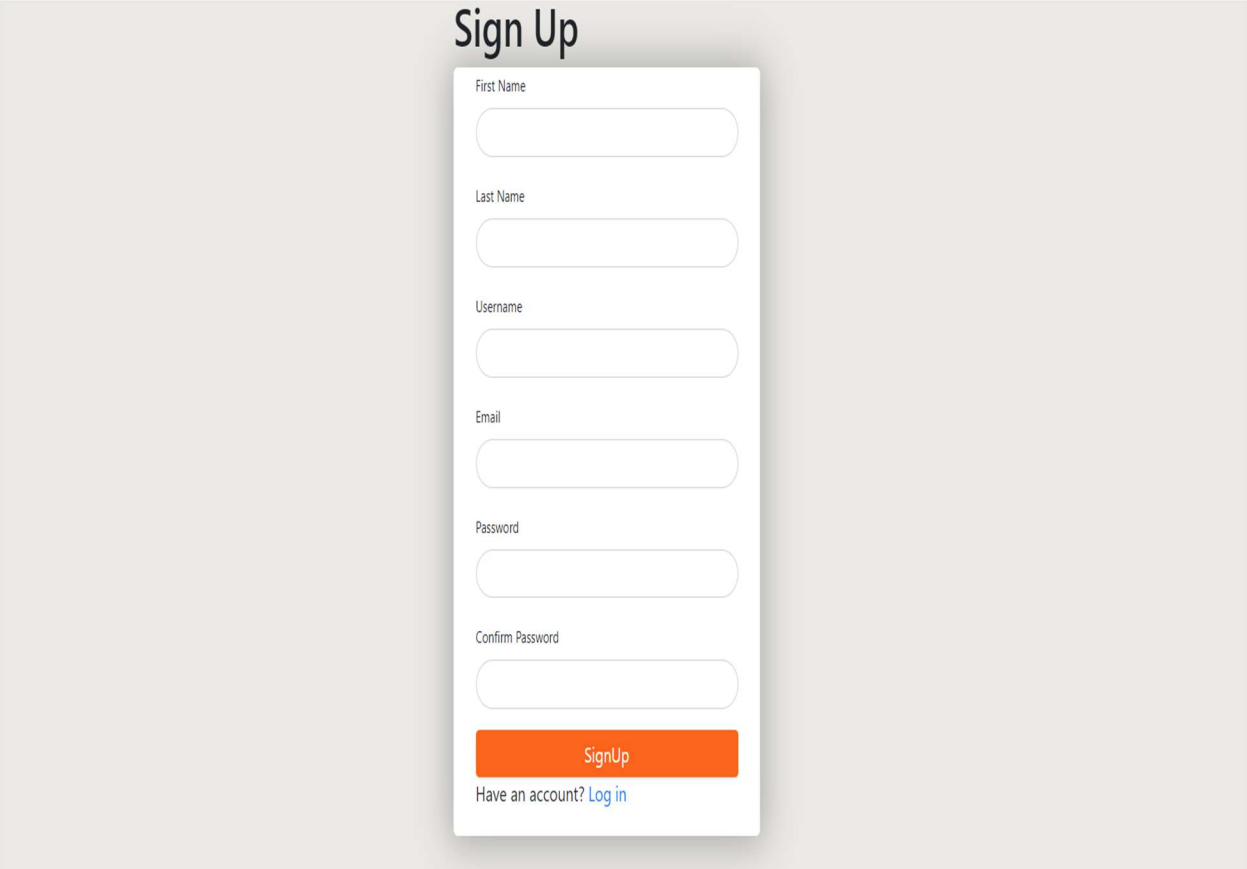
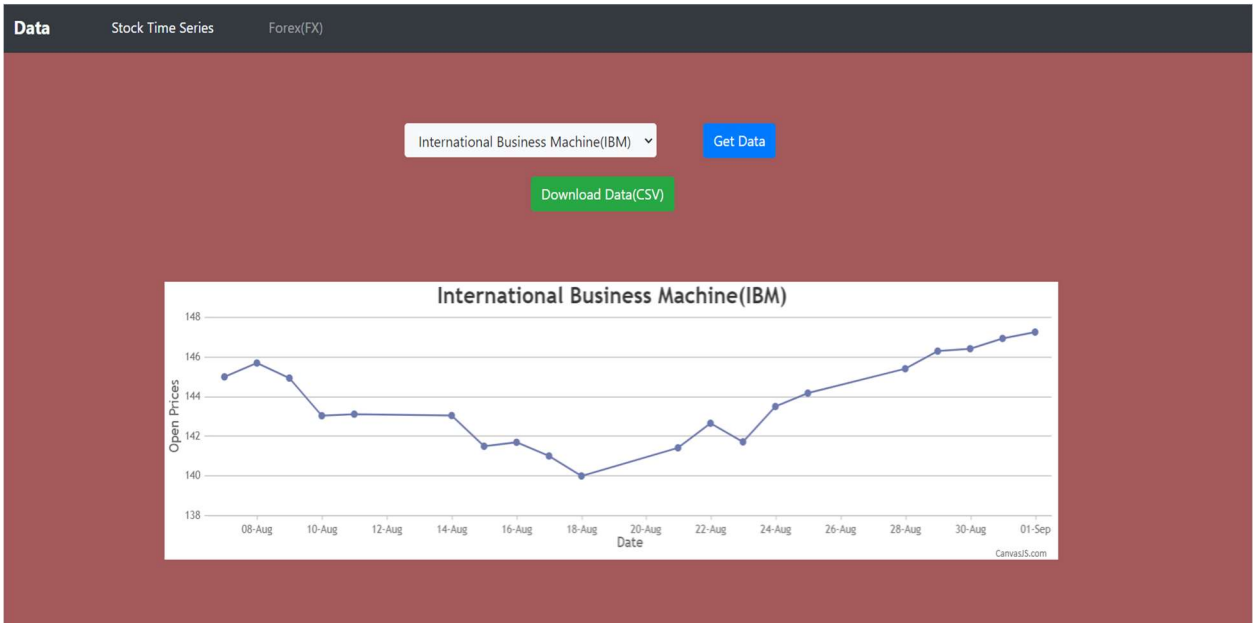


Fig.9.2. Sign Up Page

If user does not have any account he has to click on ‘Sign Up’ option, to create his account with providing the required information. Then user has to login to go towards next page.

9.3. Stock Time Series Page:



RECENT END OF DAY PRICES

Date	Open	High	Low	Close	Adjusted Close	Volume
2023-09-01	147.26	148.1	146.92	147.94	147.94	2727796
2023-08-31	146.94	147.7275	146.54	146.83	146.83	3885949
2023-08-30	146.42	146.92	145.7452	146.86	146.86	2245402
2023-08-29	146.3	146.73	145.62	146.45	146.45	2778113
2023-08-28	145.41	146.74	145.21	146.02	146.02	3561347
2023-08-25	144.18	145.47	143.5	145.35	145.35	3660147
2023-08-24	143.505	144.47	143.22	143.55	143.55	2900244

Fig.9.3. Stock Time series Page

Stock Time series page is the next tab after the login page in which user can select the stock name, then clicking on get page will display the stock price graph and recent days price of stock.

9.4. Forex Data Page:

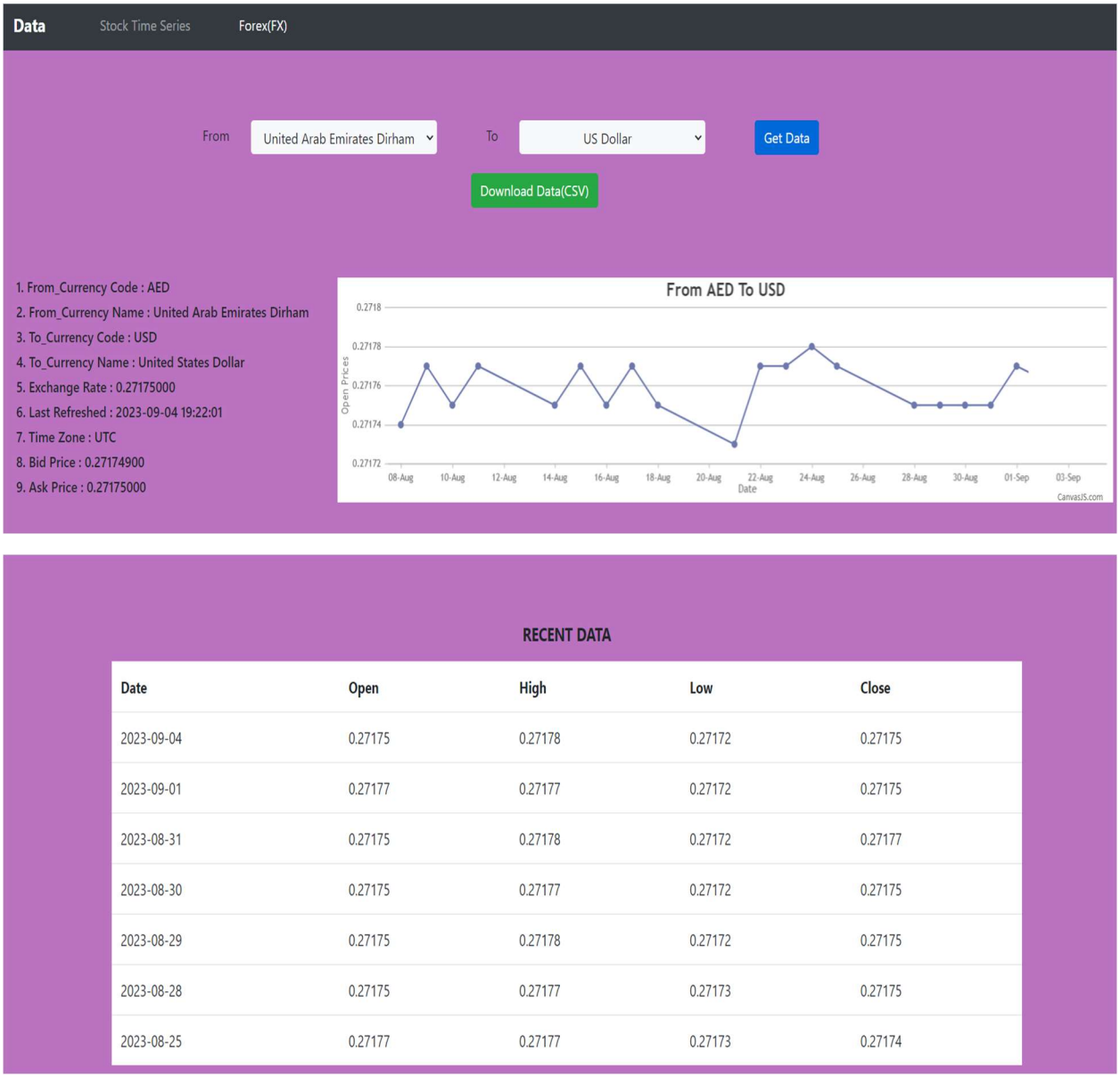


Fig.9.4. Forex data page

The last page is forex data page in which user can select global market currency, the page will show the data of that currency.

10. ADVANTAGES

- **Educational Empowerment:** The platform empowers new learners with the knowledge and skills required to navigate the complex world of stock trading, making it easier for them to make informed investment decisions.
- **Visual Learning:** Visualizing real-time stock data through interactive charts makes learning about stock market dynamics more intuitive and engaging, aiding comprehension for users with varying levels of expertise
- **Technical Analysis:** Integration of technical indicators provides users with tools to analyze stock trends and make informed predictions.

11. DISADVANTAGES

- **Market Risk:** The platform may inadvertently encourage inexperienced users to engage in stock trading without fully understanding the associated risks, potentially leading to financial losses
- **Overreliance on Technical Analysis:** Users might rely solely on technical indicators without considering fundamental analysis, which could lead to incomplete decision-making.

12. APPLICATIONS

- **Financial Education Institutions:** Schools, colleges, and universities offering finance and investment courses can integrate the platform into their curriculum to provide hands-on experience in stock market analysis and trading.
- **Freelance Trainers and Coaches:** Freelance trainers specializing in stock trading education can use the platform to create and deliver customized courses for their clients.
- **Trading Competitions and Events:** Trading competitions or events could use the platform to provide participants with a controlled environment to practice and showcase their trading skills.

13. FUTURE SCOPE

- By applying some Machine Learning Algorithms, we can use this data for the future prediction of stock prices
- We can provide educational resources such as articles, videos, and tutorials explaining stock market basics, trading strategies, and investment concepts.
- Enable users to set up price alerts for specific stocks. Users receive notifications when a stock reaches a certain price level.
- Implement email or in-platform notifications for alerts triggered by price changes.

14. CONCLUSION

In conclusion, the development of your Real-Time Analysis of Stock Market Segment platform holds great promise in providing an intuitive and visually engaging experience for individuals seeking to understand the complexities of stock trading and investment strategies. By combining real-time data, interactive charts, and educational resources, your platform aims to empower users with the knowledge and skills needed to navigate the dynamic world of the stock market.

Incorporating technical analysis into our Real-Time Analysis of Stock Market Segment Platform through the Alpha Vantage API brings a powerful dimension to your project. By harnessing Alpha Vantage's rich data sets and analytical tools, you empower users with the ability to make informed investment decisions and gain deeper insights into stock market dynamics.

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