**Stock Analysis Dashboard**

* **Abstract**

The Stock Analysis Dashboard is an interactive and user-friendly platform developed to simplify stock market data analysis for investors, students, and researchers. In today’s fast-paced financial environment, analysing large datasets manually is inefficient and time-consuming. This project integrates Python, Streamlit, Plotly, and the Alpha Vantage API to deliver real-time and historical stock market insights. Users can select a stock of their choice, specify custom date ranges, and generate detailed visualizations such as candlestick charts, line charts, and Relative Strength Index (RSI). The dashboard also provides a performance summary including start price, end price, and return percentage, helping users quickly evaluate stock trends. Additionally, it offers an option to download the analysed data in CSV format for offline study or further financial modelling. The system’s lightweight design ensures accessibility across devices, making it a practical solution for both beginners and experienced investors.

* **Introduction**

Stock markets generate massive amounts of data daily, and making sense of it is key to informed decisions. Traditional analysis often relies on static spreadsheets or complex tools, which can be difficult for beginners. This project offers a simple, web-based Stock Analysis Dashboard that emphasizes accessibility and ease of use.

Built with **Streamlit** and **Plotly**, it allows users to explore stock data interactively without advanced technical skills. The dashboard supports global companies like Apple, Tesla, Reliance, and TCS, while also including indicators such as **RSI** to help identify market conditions. With options to choose custom time frames, it caters to both long-term investors and short-term traders, showing how modern tools can turn raw market data into actionable insights.

* **Tools Used**
* **Programming Language:** Python
* **Framework:** Streamlit
* **Visualization Library:** Plotly
* **Data Handling:** Pandas
* **API Service:** Alpha Vantage
* **Steps Involved in Building the Project**

1. **Setup Environment:** Installed required libraries such as Streamlit, Pandas, Plotly, and Alpha Vantage.
2. **User Interface:** Designed an interactive sidebar in Streamlit for stock selection, date range input, and data fetching.
3. **API Integration:** Connected the Alpha Vantage API to fetch historical stock data.
4. **Data Processing:** Cleaned and transformed raw data, including open, high, low, close, and volume prices.
5. **RSI Calculation:** Implemented 14-day RSI to identify overbought or oversold stock conditions.
6. **Visualization:** Built candlestick, line, and RSI charts using Plotly for better insights.
7. **Summary Metrics:** Displayed start price, end price, and return percentage for quick evaluation.
8. **Export Feature:** Enabled downloading of stock data in CSV format.

* **Conclusion**

The Stock Analysis Dashboard provides a **comprehensive, interactive, and intuitive** solution for visualizing and analysing stock data. By combining advanced data visualization with a user-friendly interface, it caters to both beginners and professional investors. The project demonstrates how **API-driven financial applications** can support decision-making and learning. In the future, it can be enhanced with features like moving averages, MACD, predictive models, and portfolio tracking to make it a more powerful financial analysis tool.

* **GitHub Repository Link:**

<https://github.com/Arpita368/Python-Internship-Project>

* **App Link:**

<https://stock-analysis-dashboard-k7wgjxkiakxzgddm83i526.streamlit.app/>

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