

Stock Price Analyzer with Machine Learning

Students: *Alejandro Rodriguez.*

Instructor / Faculty: *Masoud Sadjadi / Florida International University*

PROBLEM

The stock market generates vast amounts of data daily, making it challenging for individual investors and analysts to identify trends and make informed decisions. Existing tools are often expensive, complex, or lack customization, leaving a gap for accessible and interactive stock analysis solutions.



SYSTEM DESIGN

The Stock Analyzer Leverages public stock market APIs to provide real-time data visualization and analysis. The system consists of three main components:

- Data Retrieval: Fetches stock data using APIs.
- Data Processing: Cleans, processes, and prepares data for analysis.
- Visualization Interface: Interactive charts and insights displayed via a user-friendly Streamlit web application.

VERIFICATION

Multiple test cases were implemented to validate system functionality:

- Tested the functionality of interactive elements.
- Ensured responsive design across different screen sizes.

CURRENT SYSTEM

Current stock analysis systems include commercial platforms and APIs, such as Yahoo Finance or Bloomberg, which offer robust tools but are not easily accessible to beginners.

These systems often require technical expertise or subscription fees, creating barriers for casual or independent users.



OBJECT DESIGN

The application is modular, with objects representing different functionalities:

- StockData: Handles API requests and data formatting.
- DataAnalyzer: Performs calculations like moving averages and volume trends.
- Visualization: Generates charts for stock performance.



SUMMARY

The Stock Analyzer successfully provides a lightweight, accessible tool for stock trend analysis and visualization. Users can interactively explore market trends and metrics to make informed decisions. Future work includes adding advanced analytics, such as predictive modeling and portfolio tracking.

REQUIREMENTS

Functional: Fetch historical and real-time stock data, compute key metrics (e.g., moving averages, daily price changes), and generate interactive plots.

Non-functional: Quick response time, intuitive design, and support for multiple stock symbols.



IMPLEMENTATION

Frontend Developer

- Designed and implemented the layout of the Streamlit web application.
- Integrated widgets like dropdown menus, sliders, and text input fields for user interactivity.
- Focused on seamless navigation between different sections of the app.



REFERENCES

APIs: Alpha Vantage, Yahoo Finance.

Tools: Python, Streamlit, Pandas, Matplotlib, Plotly.

Tutorials and Documentation: Official API and library references.



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