

Knight Foundation School of Computing and Information Sciences

Fall 2024 Senior Design Project

Stock Predictor

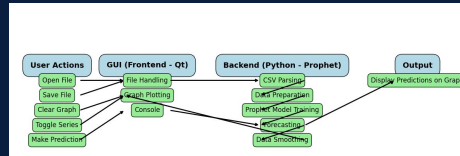
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PROBLEM

Stock market fluctuations are highly unpredictable, presenting a major challenge for investors and analysts. Existing solutions often lack personalized user experiences and efficient ways to track stocks, which limits their effectiveness. Our project addresses this issue by integrating the predictive power of traditional algorithms with a user-friendly web interface, allowing users to easily log in and track stock data.

APPLICATION DESIGN



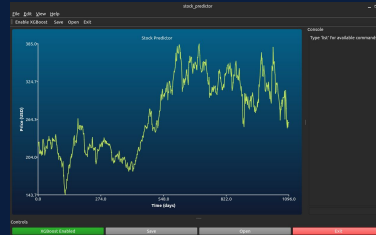
TECHNOLOGIES

- C++
- Python
- Facebook Prophet(ML)

MAKING PREDICTIONS

The machine learning approach we are using leverages tools like Matplotlib and Pandas. These libraries will analyze historical stock data to make accurate predictions about future values. The algorithm will also generate a CSV file containing the stock's current and past values, allowing users to review historical data and make more informed investment decisions.

APPLICATION FEATURES



Our stock prediction app leverages advanced machine learning to provide accurate forecasts of stock prices. It offers personalized recommendations based on user preferences and risk profiles. With real-time updates and easy-to-understand visualizations, users stay informed about market trends. Social features encourage collaboration among investors. With its intuitive interface and robust features, our app is essential for optimizing portfolio performance.

Programming Languages:

- Python
- C++

Database:

- .CSV File

Frameworks/Libraries:

- Python
- Pandas
- Matplotlibs
- Qt framework used for the user interface

MACHINE LEARNING ALGORITHM

A Python script forecasts stock trends leveraging the **Prophet** library, designed for accurate time-series forecasting. The tool processes a CSV file containing stock data columns like 'Date', 'Open', 'High', 'Low', 'Close', 'Adj Close', and 'Volume' to predict trends for a user-specified number of months. For each column:

Modeling: Fits a model with yearly seasonality and additive seasonal patterns.

Forecasting: Generates future data points and smooths predictions with a rolling average for better clarity.

Integration: Combines forecasted data with historical records.

SUMMARY

Our project gave us the opportunity to work as a team and learn new skills that we wouldn't have gained otherwise. By using new tools such as XGBoost, Python, HTML, and CSS, we've developed a user-friendly platform that provides stock predictions with accuracy and efficiency. Through using frameworks such as Flask, and libraries like SQLAlchemy, Pandas, and Matplotlib to create this project, we have gained a profound learning experience. Moving forward from this project, these lessons gained will undoubtedly assist us in our future endeavors towards success in the dynamic field of technology.

FUTURE WORK

In the future, our stock prediction app could incorporate advanced machine learning models and utilize alternative data sources such as social media sentiment and satellite imagery for deeper economic insights. Personalization features would tailor recommendations based on user preferences, while improved visualization tools would allow for more interactive data exploration. Additionally, blockchain technology could facilitate decentralized prediction markets, enabling crowd-sourced insights. Positioned at the cutting edge of financial technology, our app will provide investors with powerful tools and valuable insights to enhance their decision-making.

