CPSC 471 Database Management Systems

Project Proposal

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Introduction

Day stock traders currently use a whole bunch of spreadsheets to keep track of information about each stock for example like the change percentage, volume, number of employees the company has and etc. The current setup of a stock trader could potentially lead to inefficiency to insert, update data so a better interface is recommended to update this old format of using rows and columns to store data. As a group, we decided to improve the daily life for a stock trader by creating a database that will greatly improve the work quality. The main target to achieve is to design and create a database system with a user-friendly web interface to make life easier for stock traders. With the upcoming concepts we learn throughout CPSC 471 we plan to expand the project with the syllabus in mind. The motivation behind this project is to provide a free platform for traders or beginners to have a personalized feel of the stock exchange in the market at their fingertips.

Problem Definition

It's hard to monitor the stock market as there are a large number of stocks that vary in price rapidly. It would be quite tedious to be using spreadsheets to track if stocks are going up or down. Over the years and through the democratization of the stock market more people have access to more opportunities than ever before. But meaningful insights are hard to come by for the average investor. Over the years mathematicians, economists, and businessmen have created solutions to combat the sheer scale of the markets to make them more manageable. Through breakthroughs in computing to new mathematical vantage points every year the field is getting more and more crowded and now after decades of advancements, there are as many tools as stocks. But with machine learning (ML) and neural networks on the rise, a new era of computing will house the answers to investors' most critical questions. This problem is interesting because as the stock market becomes more accessible to the average person, there is potential for people with minimal stock knowledge to make financial gains. Also for other users, it makes data collecting about a variety of stocks easier since all of the data about their stocks are located in one place. The problem occurs daily, weekly, monthly, and yearly. As there are a variety of different types of stock trading. The problem occurs due to a large variety of stocks that are hard to track. One might have a weaker portfolio since they do not currently have a localized place to track when each stock is up or down. A problem like this can never be solved in the constraints of a Newtonian model where there is linearity and cause and effect. We can only hope to refine the solution over time to be more accurate. AI-driven stock tools do exist but the nature of AI means there is always room for more. There are similar systems in place already, some are Stock Rover, EquityStat, Delta Investment Tracker, and Google Sheets. Stock rover is a research and analysis tool that can be used on a desktop or as an app. With Stock Rover, you have the option to compare stocks and your own investments, get a full research report on any stock, and add your personal portfolio. EquityStat can be used to track a portfolio, or you can manually, or add a CSV file to follow specific stocks. Delta Investment Tracker is an app that can be used to track crypto exchanges as well as stocks, ETFs, indices, forex, mutual funds, bonds, and can be used to link your personal portfolio. Lastly, Google Sheets can be used to track a portfolio and can be used alongside google finance to get information on stocks. AI-driven approaches stem from the vast amounts of data companies and governments have accumulated over the years. But AI will

always require more data and more importantly new data entities to shed groundbreaking insights for an evolving world.

Motivation

There are lots of data and indicators in the stock market, but no way to decisively act on it. With many tools, data and analytics the view is clouded and muddy. To gain clarity in a sector filled with fear, chaos, and opportunity we seek to build the foundation for an AI driven model. We aim to use the massive quantity of meaningless data and turn it into actionable insights with AI first approach. We will construct a generic stock market scanner tool for investors, but with an AI first approach for future expansion.

Proposed Solution

The aim is to create a DB for Stock Tickers. Top gainers, losers, monthly, weekly, yearly. With the schema-based including the stock exchange, sector (tech, biotech, mech, finance, transportation), and other info. Create a data set that can eventually be used for AI to forecast stock movement. The project is planned to work towards creating a database for the stocks in which you can search and filter based on your desired goal as a stock trader. For example, if you want to look at the top-rated stocks on our web application it will be accessed easily. We plan on implementing a user-based system in which you would have logins to monitor personalized stock feeling with the option to rate stocks as well from experts. The project will produce an interface to link between day stock traders and the world of stocks allowing for easy access rather than having multiple tabs of Excel spreadsheets; this project will be concise to a simplified website. Some of the main features that the project will entail include the ability to view different stocks based on our API system which we will design using the framework of our choice. The second feature is a login system that will be using HTML/CSS to create the form with a backend language to allow for the form to be stored in a database with all of the users on the website. The other major function of our project is being able to modify the stock's rating in order for us to make queries to our database to update it with the correct information.

Conclusion

With the amount of data spread across for stock traders, our solution aims to bring everything into one commonplace. The solution is a similar format to a stock scanner which is found on financial websites such as Yahoo Finance. Our goal is to build a web-based design that will merge all of the issues with the current setup of tracking stocks and being able to analyze which one is doing the best. The motivation for this project is to localize data for tracking different stocks. The future plan of this data is to create a location that can be used for an AI to be developed that can predict stocks. The proposed solution is that we are implementing a user-based system that will be used to monitor personalized portfolios with the option to rate specific stocks. Our product will allow for each individual's information to be stored in a database with all of the users on the website. The other major function is being able to create a rating system for individual stocks based on how they are trending in the market. A rough estimate of our final project dates alongside the reports due throughout the semester.

- Project proposal: Sept 30th
- Design: Oct 11th
- Receive Proposal Feedback: Oct 12th
- Wireframe/ EER diagram: Oct 18th
- A detailed extended/expanded ERD and all the related assumptions are due on 22 October(11:59 PM).
- Prototype: Oct 25th
- Development: Final iteration Nov 30th
  - Different Iterations -- *discuss what we want per iteration*
  - The initial (logical) relational model due on 05 November(11:59 PM)
    - 1st Iteration Nov 15th
    - Functional (programming) part of the project and the Web design due on 25 November (11:59 PM)
    - 2nd Iteration Nov 30th
  - Testing -Dec 1th
  - Final Report due on the last day of classes
  - Demos in the last week of classes or in the exam week.

References

For the current app research:
1. **https://www.stockrover.com/why-stock-rover/**
2. **https://www.equitystat.com/portmgr/pages/featurelist.aspx**
3. **https://delta.app/en**
4. **https://towardsdatascience.com/predicting-the-stock-market-is-hard-creating-a-machine-learning-model-probably-wont-help-e449039c9fe3**