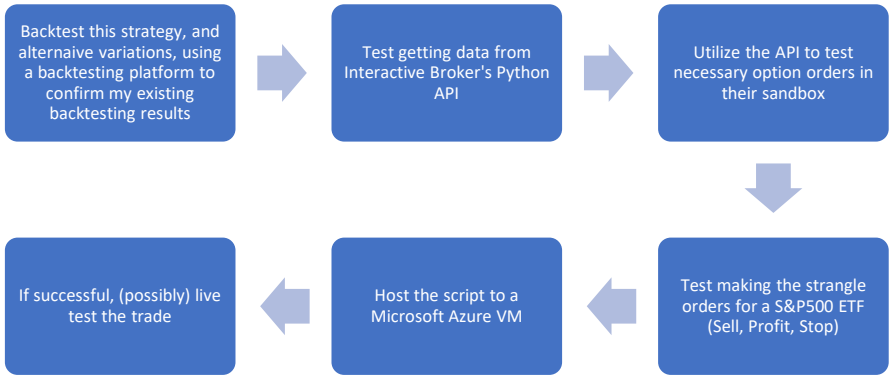
Lucas Troy
Junior Design: Spring Semester 2023

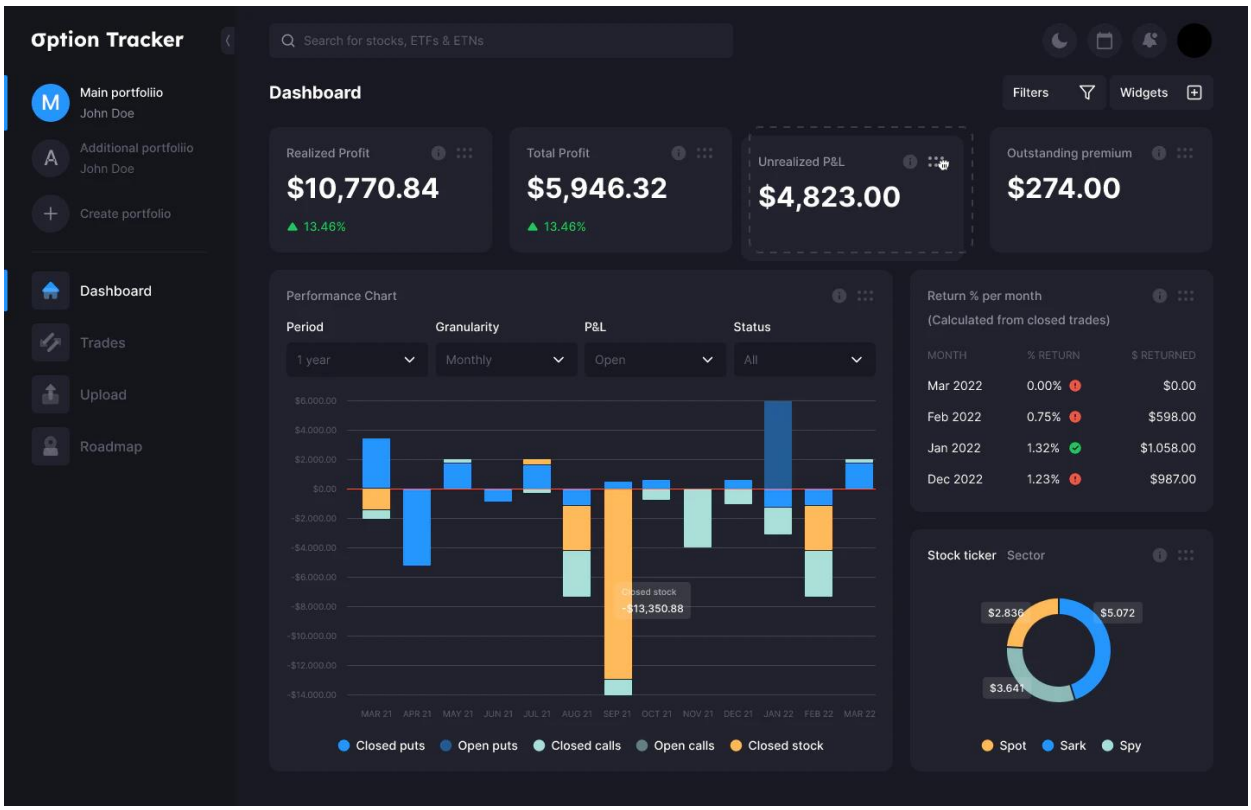
Design Project #3 Proposal: Delta Neutral Futures Options Strategy Implementation

Project Overview:

I have been interested in stock trading and finance since I came to college. This interest has led to my passion to study the idea of value in the markets. I would like to automate an existing strategy that I currently do manually that has generated consistent profit for me almost 80% of the time. Here is a slide deck of the strategy. At a very high level, the overall process of development will look like this flow chart. It may change between now and the final product, but I think that is the point of this project



This is a very ambitious goal, but I think it is achievable in the amount of time I have given there are many pre-existing frameworks I can tweak to get something I want. Below is an ideal example of the UI I intend to design. I do not intend for it to look exactly like this.



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Required Resources:

- List of Resources:
    - Computer/Laptop/(Super Computer?)
    - PyCharm (IDE)
    - Free Zorro Trader License
    - Free TastyLive Backtesting Platform
    - Free Python Libraries for web scraping, and data manipulation
        - Pandas
        - Numpy
        - IB_Insync
        - Etc.
    - VM Hosting the Final Product
        - Microsoft Azure
- Estimated Budget: $100
    - VM Hosting the Final Product
    - Professional Backtesting Software or Platform
        - Option Omega, Option Alpha, etc.

Project Justification:

I feel that my project is justifiable as it will benefit me in the future when I look for quantitative analyst/trader positions. I am also interested in getting involved with hedge fund startups that use machine learning and artificial intelligence to increase their returns. This project would set me apart from the rest, especially if it outperforms the market with lower volatility. I do not think this project is too easy as option trading can be quite difficult to implement correctly, however, I am prepared to learn as much as possible to make a working prototype. I do not think it is too hard as there are many (free) available resources on the internet to help me, as well as numerous existing frameworks.

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Schedule:

Week 0-2
- Build a working backtesting model in a backtesting platform to find the optimal model
- Test linking the backtesting platform to Interactive Broker's API
- Update the milestone report

Week 2-4
- Test getting data from Interactive Broker's API
- Test the ordering for the optimal model in the sandbox
- Update the milestore report

Week 4-6
- Host the script using Microsoft Azure so it can run in the cloud
- (Live Trade)
- Finalize the project report and presentation

For my final presentation I hope to demonstrate my working website with a fully functional progress tracker. I will demonstrate how to show the outcome of the open and closed trades. I will also show how to display the performance of the model's decision making against the S&P500 index as a benchmark. In terms of intermediary results, I will go over my optimal-model-making process by displaying some of the behind-the-scenes work, such as my research notebook that I used to refine my model.

Potential Roadblocks:

With this project, I can see myself struggling with getting the outcome hosted to a domain in time. Depending on the amount of time needed to determine the optimal model, and finalize the live trading framework, I may have to rely on displaying my findings neatly at the end of the notebook and/or making a presentation. I would however go back later to this project and host this in the cloud if I am not able to do so in this timeframe. I am just not sure there will be enough time to do the model tuning, framework, and host it in 6 weeks.

Worst case scenario, I am only able to make the optimal model and the local live trading framework. If I am unable to create good plots, which I find highly doubtful, I will at least be able to display statistical data for the presentation given by the backtesting platform.

Lastly, I do want to mention, I have experience trading and creating trading models, however, I have not had much experience hosting scripts in the cloud. While I think the latter is the easier part, I have full confidence in myself to be able to figure it out in the time allotted. If not, the backup will always be to save the plots as pictures to create a well-done presentation for the final report, as well as demonstrate the project locally.