

# Team Project Write Up: CS 142

## Investment portfolio simulator

Members:

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*Start with the relevant information from your brainstorm. What was your initial idea? How much did you initially decide to keep, expand, or change from the brainstorm?*

The original idea was to create a program that would allow the user to buy stocks and index funds based on the most recent available real numbers. After the initial zoom meeting our group decided to expand the assets available for purchase in the program to include bonds, land, and real estate. After meeting with our instructor we changed the idea of having characteristics listed in several arrays to building several classes where we would do the same thing and be able to create objects in the program. For fun we added a ridiculous asset called Doge with abnormal characteristics from the rest of the things a player can purchase.

*Then, define and specify the project that you created. Please try to review your designs and models in a systematic way, referencing the code you wrote (class designs) and the behavior of your program. You may want to include sections for each component of the project, which (depending on how your project went) could include how the team management worked and how concepts were developed (including narratives).*

Our group modeled the investment portfolio simulator on some of the code from crickets and grasshoppers, in that there is a lot of user input. We created a superclass called "Asset" and several subclasses that would allow the program to create objects as the user selects what they would like to purchase. Every type of holding has set values such as dividends or a ten year growth estimate that factor into the simulations a player can run on either an individual holding or their entire portfolio.

For behavior there are three parts:

The first is the beginning of the program where a player starts out with \$500,000 to spend on a list of 13 different assets. They'll be asked what they would like to buy, how many they want to purchase and then asked to confirm the purchase which will list the information and total cost. Once a player is satisfied with what they've purchased they'll move on to the portfolio screen.

The second is the portfolio screen which lists the player's holdings and basic information for each. From there they can either select one of their holdings or their entire portfolio. Once

something is selected they will be given more detailed information for the asset and from there can either return to the portfolio menu or choose to run some simulations.

The third part is the most fun. This is where a player can run simulations on their holdings. They can simulate things like how their portfolio would do during the stock market crashes of 2020 and 2008, how much they would earn in compounded dividends over the course of a given amount of years, and how their portfolio would appreciate ten or twenty years from now based on real ten year growth.

Finally in terms of team management, we decided to create a discord server for the project where we can share files back and forth as well as talk in the group chat. It was a really useful platform for having everything in one place and allowing members to post questions as well as designate tasks.

*After that, describe the differences between what was accomplished and what you intended to accomplish, recognizing the limits and constraints of the project as well as any knowledge gaps. Note that "overscoping" (planning a much more ambitious program than you actual created) is common and completely normal.*

Although the project did change a bit in terms of the assets in the program and the functions we decided on, we stayed within the limits of the original plan. The only problematic overscoping was the knowledge gap between those who were familiar with the functions of finance and those who were not. For example, compounding dividend returns is a complex concept for someone who hasn't taken economics or accounting.

*Finally, please include some practical ideas about how future work could proceed.*

In the future it would be better to have a more detailed plan for designating tasks like entering in variables which was a big part of this program. During the initial zoom meeting it would have been best to clarify every team member's understanding of the project as well as concepts such as compounding interest. It would have been useful to make a formal list of every team member's availability to be able to plan around when parts of the project would be completed based on designated roles. Scheduling more regular zoom meetings throughout the course of the project would have helped help to keep the team on the same page with the program's functionalities as well as checking up on everyone's progress and understanding of what needs to be done.