SSW345 Final Report:

Finance Bot

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"*I pledge my honor that I have abided by the Stevens Honors System.*"

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Problem the Bot Solved

Finance will forever be an integral facet of our daily lives. It is a virtually important subject matter to be familiar with, both in theory and in our own personal applications. While financial savviness may come easy to those with experience and education, most people can afford to have greater awareness of their equity trends and habits. Full financial comprehension relates to both user spending, and the various types of income or assets they may have. With greater knowledge of one's trends and standings, the user may and hopefully will make wiser financial decisions. Our lives depend on balancing finances, and everyone deserves to and should have services and applications dedicated to aid in such responsibility.

The American education system has not emphasized financial literacy as a necessary requirement, and as a result of overlooking the subject Fortune Magazine reports that "nearly two thirds of Americans can't calculate interest payments correctly" - which is considered to be a basic element of finances.

Thankfully, there are easy and accessible ways for the average person to gain control over their finances. The power of data and how it is represented is incredible - the impact of being able to visualize routines and tendencies of the past is more powerful than a stack of receipts could ever achieve. Whether it be from having too many online subscriptions or splurging a daily cup of coffee, there are always opportunities, whether they be great or small, for one to better themselves and their spending habits. On the other hand, there are also incredibly beneficial advantages of having greater awareness of one's assets as well, such as their 401K and IRA account performances. Financial advisory business SmartAsset confirms that "individuals with higher levels of financial literacy tend to adhere to better financial practices – such as having an emergency fund and planning for retirement – and are also more likely to build wealth further".

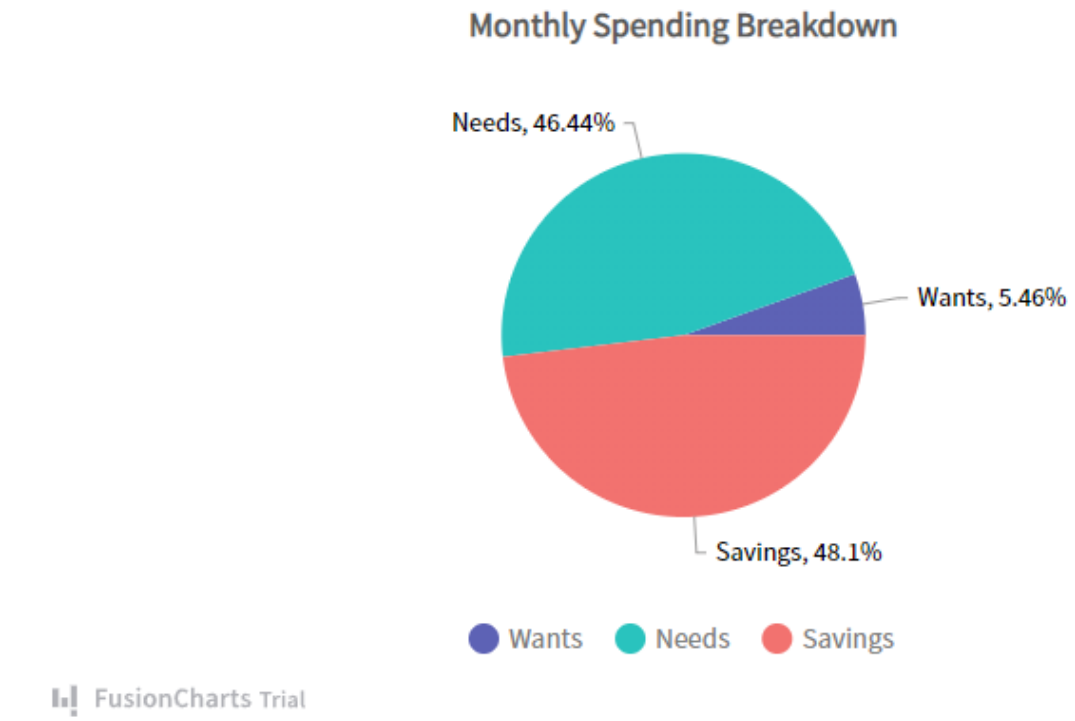
Our bot performs a variety of services for its user, the bot will have the ability to accept the user's spending data. The bot can accept the users accounts receivable (income) and accounts payable (spending, saving, etc.), and then categorize them based on the nature of the transaction. For spending purposes, our service will categorize based upon use like food, rent, entertainment, and many other ways that you can spend or save money. The bot will prompt the user for all the data inputs mentioned, and then create graph visualizations based around the information. Along with these dynamic visualizations, a main function of the bot is to recommend tips to the user to help them with both saving and spending habits based on their inputted data.

Primary Features and Screenshots

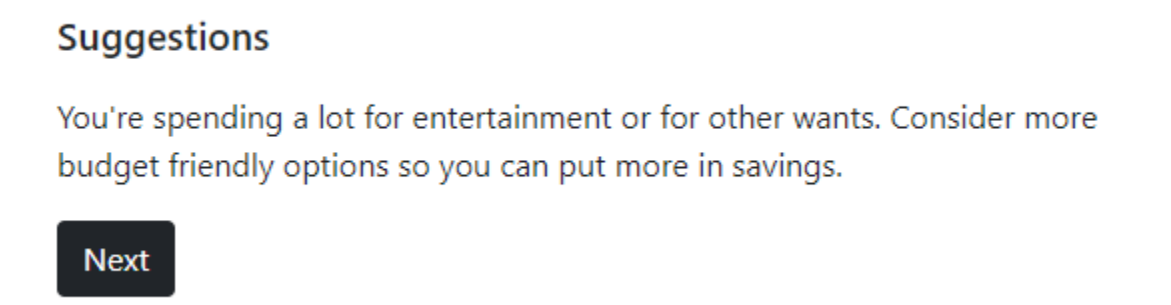
The financial-bot is capable of showing a user's account balances, visualizing financial metrics, and giving suggestions and facts based on the user's financial information. One important feature of the financial bot is to show the balances of all accounts of the user. Using a data visualization module, the financial bot generates a pie chart that shows the percentage of

their spending. This gives users a simple but great visualization of their spending. The other primary feature of the bot is to give suggestions that will assist users in making better financial decisions. These suggestions are based on a rule-based system that uses financial information such as spending.

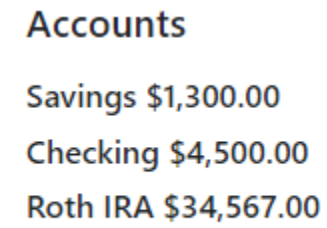
Pie chart displayed on the homescreen that shows the breakdown of user spending



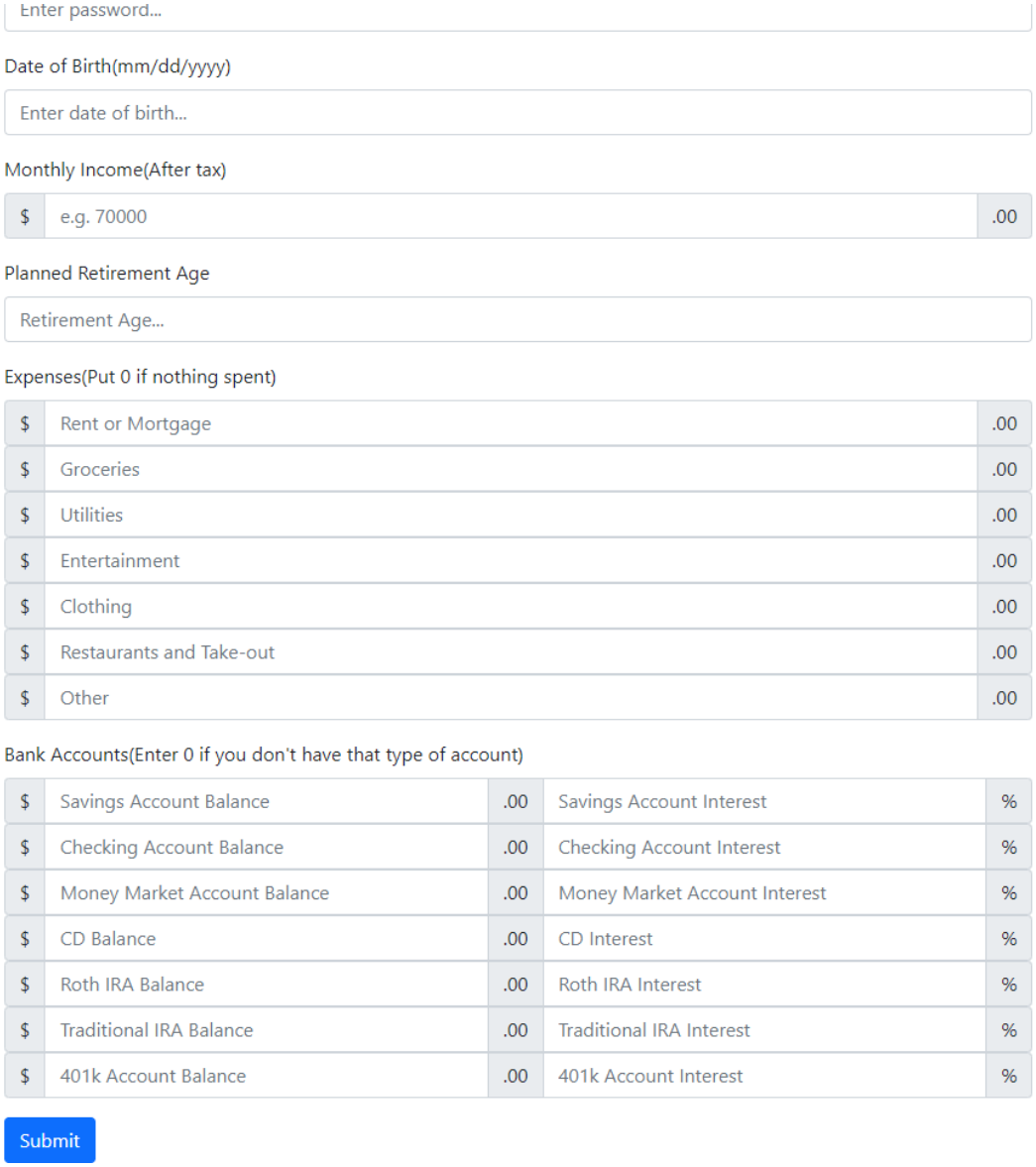
This is how suggestions are shown to the user. The next button displays another suggestion



This shows the balance of each of the user's account



This is the Sign Up page. Here, users put in their specific financial information.



Reflection on the Development Process and Project

Overall we believe that our team did a great job on the development process of this bot project. We used many of the resources and techniques shown to us in class throughout each stage of development. With our project we can divide the development into two different sections, the planning stage and the development stage.

For the planning stage we had used a variety of techniques in order to determine what wanted the finance bot to look like, how we wanted it to work, and what techniques we would use to get it to function. The first step in the planning process was for us to figure out what we wanted the bot to do in this step we set out to map our requirements for the bot detailing all of our ideas for it and separating them into must haves and wants. We did this in order to determine what the bot needed to have to be presentable and in what areas did we want to go the extra mile, here we also determined the scope of the project was going to be small. From there, a variety of designs were developed to model the UI, to do this we used google drawings in order to map out the UI. While google drawings isn't sophisticated software we didn't need something robust for this project as its scope was small. Then we created UML diagrams to determine how the bot was going to function, during this step we created some sequence diagrams, architecture diagrams, and some user stories.

Then began the development stage, in which we started coding the bot. The development of a process to keep track of what we had to do and what we had done was necessary, and we decided on using githubs development features to do this as well as weekly meetings to discuss. On github we had used the Kanban board in order to keep track of what had and needed to be done. The kanban project board was particularly useful because it allowed us to label each issue: frontend, backend, documentation, bug, etc. It also allowed us to assign issues to different people and classify them based on who. We used each of these features in order to classify the issues and features with the project that needed to be fixed or implemented. We met in between once a week and once every two weeks to discuss our progress on the project. Those meetings were scrum meetings to discuss our progress and problems we were running into as well as rediscussing the actual requirements that the project had to fulfill. Using those techniques during the development process we were able to complete the project.

Limitations and Future Work

We believe this will be an incredibly beneficial solution to help people, as we believe the problem of peoples' finances can be alleviated through appropriate spending habits that the bot can help the customer achieve. However, this is just our minimum viable product. Ideally, the bot would connect right to the user's bank accounts and grab the data via various API's. However, this proved to not only be challenging, but could prove to be a large liability if the bot were to be released. The developers of any project have a responsibility to keep user data as safe and secure as they can. This is especially true if we are dealing with financial data. If we were to lose or

unsecurely hold onto financial data, we open ourselves up to many legal issues from both regulatory bodies and from users. Even so, many large financial companies provide API's to get user information. This would require us to hold onto a user's login information, which provides us with another security liability. Also, implementing the different API's was taking a lot of time which we did not have. To alleviate this, we came up with a couple of possible solutions.

One possible solution was to allow users to upload images of receipts. We would then analyze the receipt, and put it into the correct category. The problem with this was mainly that no one in the group had experience with image processing, and therefore this solution would take up a large amount of time. Another possible solution was analyzing user emails. Many times, receipts from transactions are sent as emails. Our bot would look at those emails and pull the information we need from them. This solution, however, would still require us to hold onto extra private data from the user. It would also take a large amount of time to write a program that can analyze emails and pull the data effectively. To simplify our work, we only asked users to fill in general information about their income and spending.

As for functionality, there are a couple of features that were left partially finished as there was not enough time to complete. One of these was how transactions worked. The bot was going to be built to handle more specific transactions that the user would categorize. It would also handle recurring transactions where the user would categorize each transaction and define how often the user was charged. Another feature that was never completed was a result of an assumption we made. We assumed that any money not spent would go immediately into savings. However, this is not true for many people. Many use much of their income to pay down debts. This could have been added if we had more time. We also want to include a brokerage tracker to help track our users stocks, and give investment advice as well. Our most important additional feature is to help direct our customer to potential savings like coupons, cheaper stores that sell the same product in their area, and possible website promotions for other products. Overall, much of the limitations came from security issues and lack of time.