

Computer Science Department

Capstone Project Final Report

Money pad

CSC 521

May 2023

By

Jackson Davis

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Student Learning Objectives

I want to better my experience working with Javascript. I want to learn more about the front-end and back-end of a web app and learning how to make a website fancy with all the extra details you can do with the frontend. I also want to learn more about the backend and figure more about the server side. I might even try to connect it to AWS, so I can run the website publicly 24/7 on a server hosted by Amazon. I will learn more about MySQL and having multiple tables to connect them to the User in some way. I will also learn more about Finance and Money Management; I'm not too good in that area. So this will help me a lot and help me in my future with managing money.

Problem Specification

This project will try to help people with their personal finance issues, help with receiving recommendations of ways they should invest into stocks based on their own style of investing. You can see recent transactions and upcoming bills to keep you up to date on any payments you need to do. The user or investor will be able to access this app from a website. They will have to create an account and use it to log in, to see their dashboard of investments, spending, transactions, budgeting, and recommendations from the developer.

When registering an account, the user will be asked their monthly income/yearly income. The user will be able to set and see recent transactions to keep everything up to date. They can set budgets for the month and see recommendations of budgeting from the developer. They can set bills that are to be paid every two weeks, monthly, yearly etc. So they can keep up to track on that and receive notifications when the date is near of the bill being due. You can also see what you're spending your money on, which is similar to recent transactions.

The user will be able to see all the stuff to do with investing. The user can see the prices of certain stocks that they input. They can set their stock portfolio, so they can keep track of it and see how much it has grown since they bought a certain stock from awhile ago. They will get recommendations from the developer based on their type of stock trading. If they're conservative, they will get safe stocks to invest in. If they're risk-takers, they will get risky stocks to invest in, but can provide a big return. It can also provide a huge loss as well.

This app is good for anyone to keep track of their finances, to receive notifications for upcoming bills and get an insight of what to spend based on your income so you don't have to go into debt. While investors can also get notifications from changes in their stock portfolio and keep up to date on changes in the stock market. Investors will also get a nice insight from the developer on what to spend on stocks and put them into based on the investor's strategy.

Solution Process and Design

Requirements Collection and Analysis

Case Background

Many people in the world do not know how to budget or spend their money wisely. They go into debt or take out huge loans, they can't pay off. Some people want to know what they are able to spend with their monthly/yearly income. People want to know what they should invest in, and if they're risk-takers. They would like to take the risky option of investing, but have a possible higher return while taking the chance of losing more as well. Some people like the conservative approach of investing to be safe with their money and grow it in the long-term. People would want to see their recent transactions.

A simple web-app that will help with your budgeting and give you recommendations based on your needs and wants, with also monthly/yearly income that is given. It will show you some options of what to invest in.

Stakeholder Identification

Users, Investor

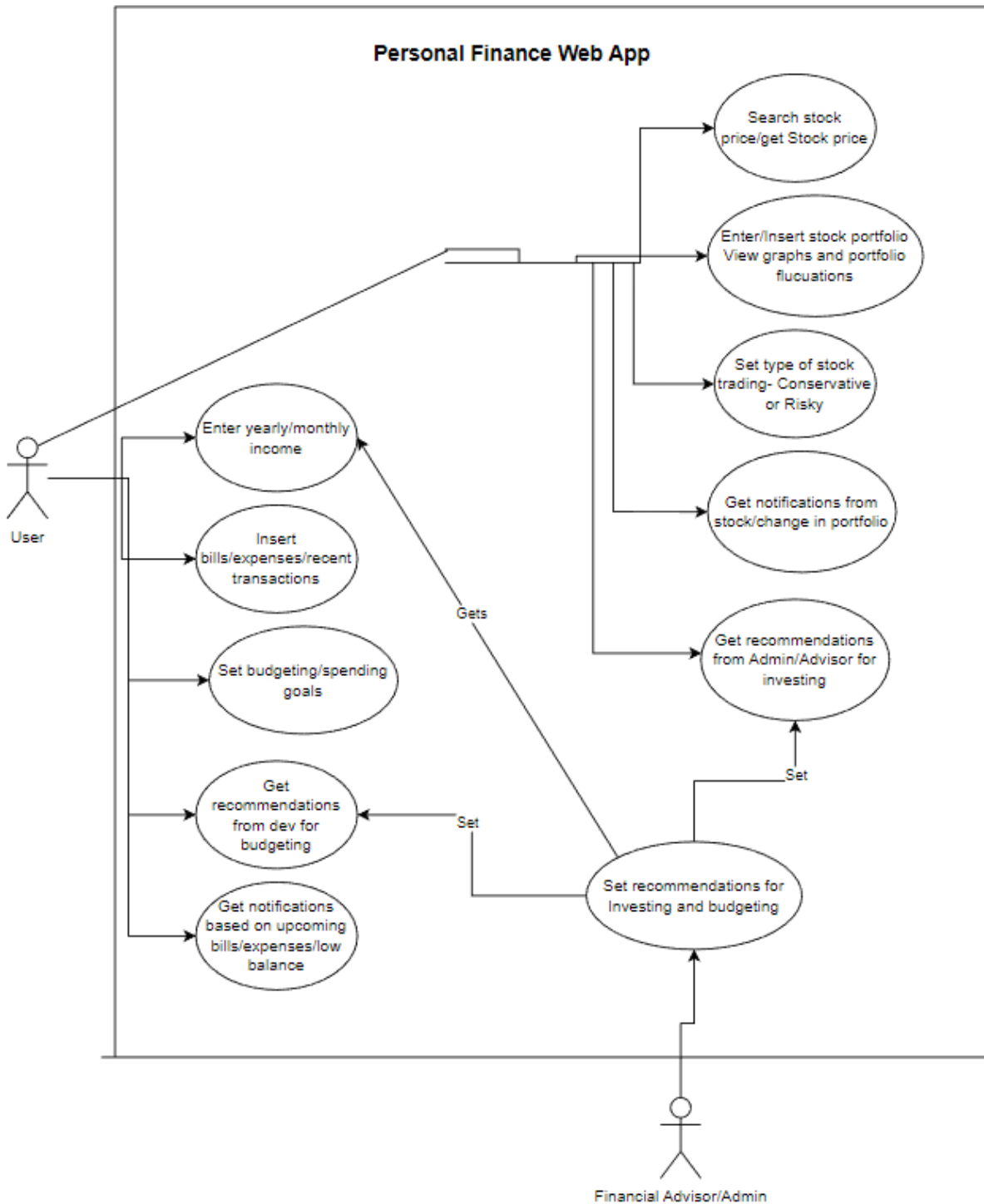
Requirements List for Requirement Specifications

1. Who can create an account?
 - 1.1. Anyone can create an account
 - 1.2. Asked for monthly/yearly income
2. User
 - 2.1. Can pick if you're a conservative investor or risk-taker.
 - 2.2. Search up price of a stock
 - 2.3. Get investment recommendation based on your type of investing.
 - 2.4. View graphs of stock prices over the year.
 - 2.5. See your current stock portfolio and stock watchlist.
 - 2.6. View recent transactions and how it affects your income/spending
 - 2.7. Set budgeting and spending goals
 - 2.8. Get simple recommendations on what type of house and car you can afford with your income.
 - 2.9. Get notifications on upcoming bills and if you have a low balance.

Assumptions

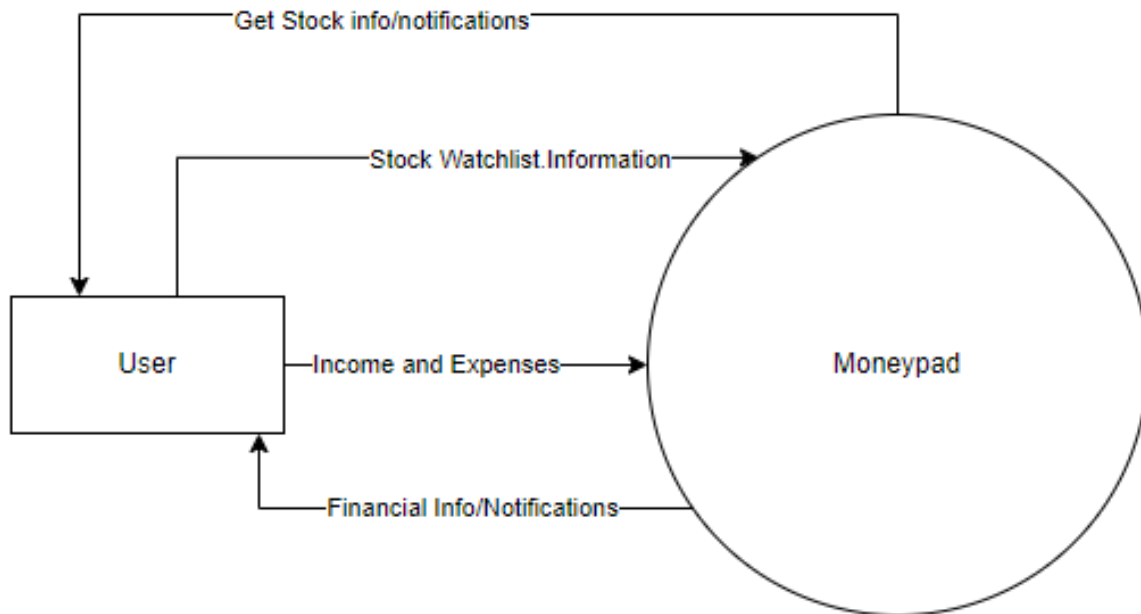
1. Database with stocks prices from an API over the last set years exists already.
2. Multiple personal finance apps exist already; I'll just add some "spice" to mine.

Use Case Diagram (UCD)



User can enter transactions, income, goals, stock information all into the database. They will also get information back from the system like recommendations and notifications based on news or upcoming expenses. User can also search for a stock price and get info from it.

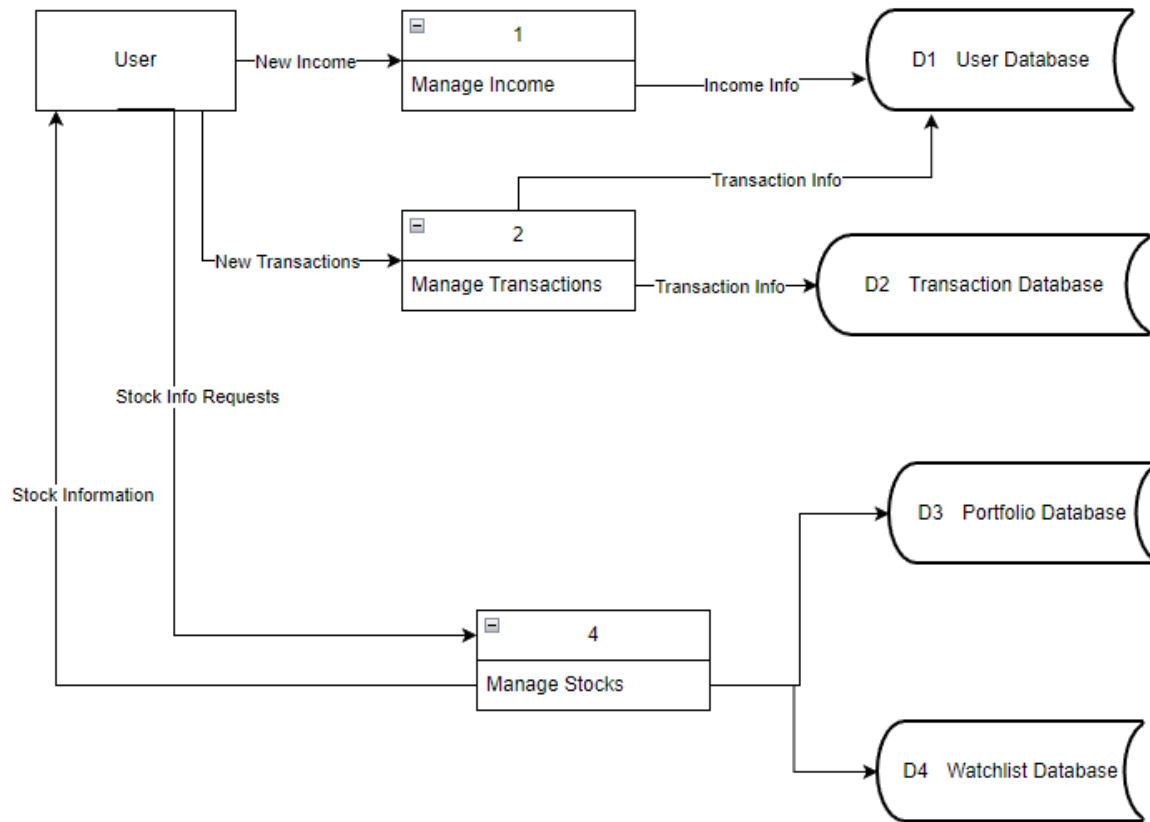
System Context Diagram (SCD)



User sends stock info and income/expenses to the System. The system sends all info back to the user after calculations and able to see notifications/recommendations from the system as well.

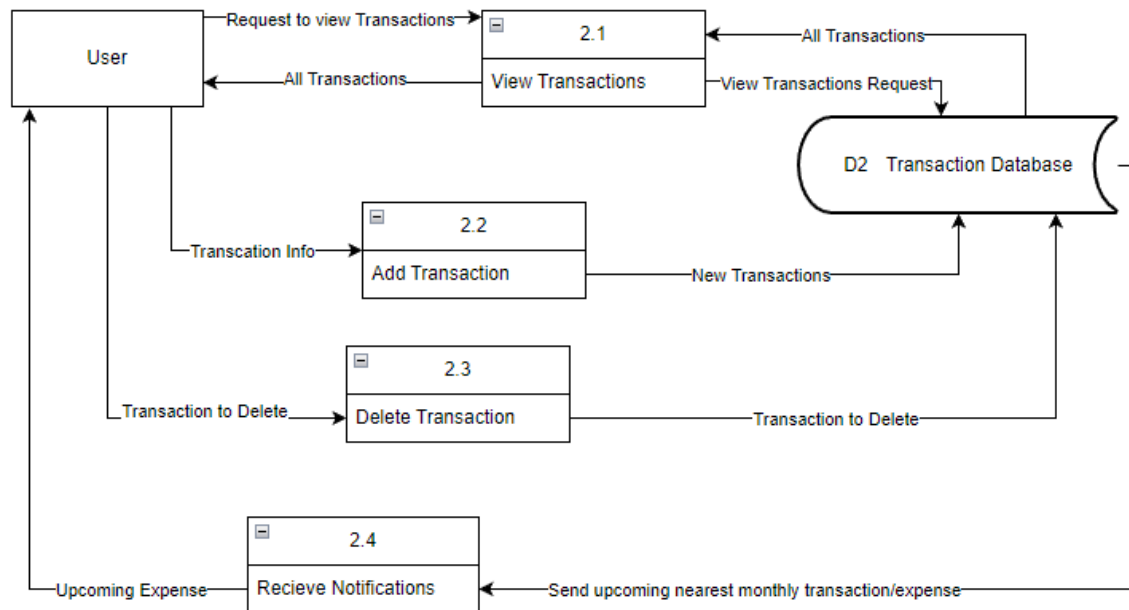
Data Flow Diagram (DFD)

DFD Level 0



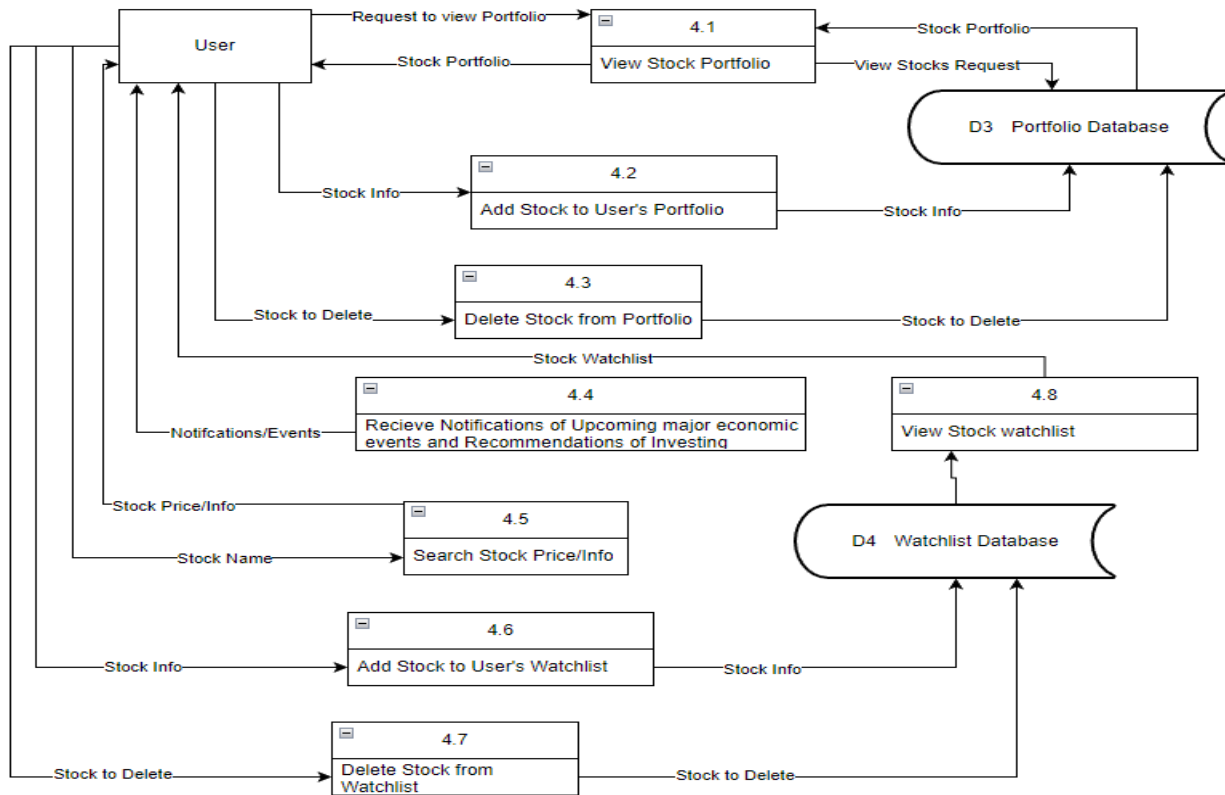
User can manage income info which goes to the user database. User can manage transactions which go to the Transaction database. User manages all the stock information which will either go to the portfolio database or the watchlist database.

DFD Level 1



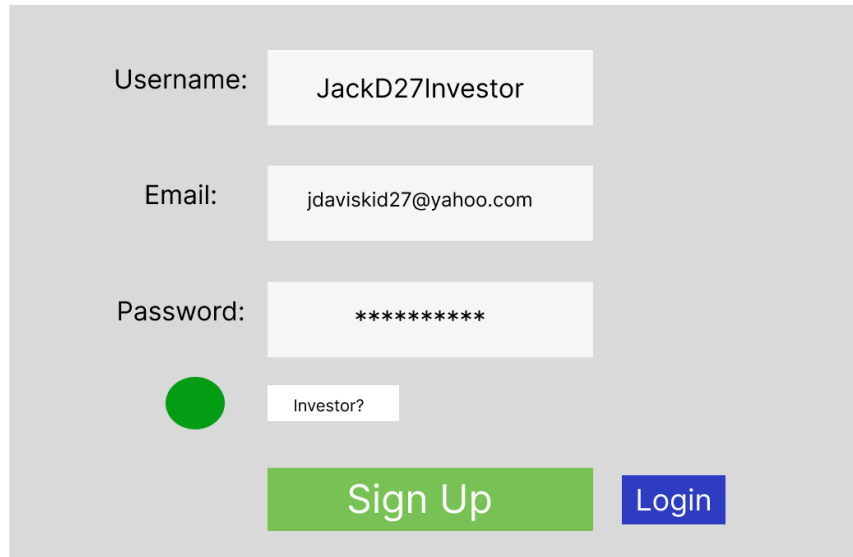
User can view all their transactions from the database that they have added. They can also delete past transactions like if something changed or they just want to remove it after inserting an error. The User will also receive notifications of upcoming expenses or like they are spending too much on the month.

DFD Level 1 (Continued)



User can add/delete stocks to their portfolio, which they will be able to view their current portfolio as well. All of this will go to the portfolio database. User will also be able to add /delete stocks from their watchlist. They can view their current watchlist at any time. The User will receive notifications of upcoming major economic events and recommendations of investing. The user can also search a stock ticker to get back info of that certain stock.

Moneyypad



A login and sign-up form for Moneyypad. It features a light gray background. The form includes fields for Username (JackD27Investor), Email (jdaviskid27@yahoo.com), and Password (masked with asterisks). Below the password field is a green circular profile picture placeholder and a checkbox labeled 'Investor?'. At the bottom are two buttons: a green 'Sign Up' button and a blue 'Login' button.

Username: JackD27Investor

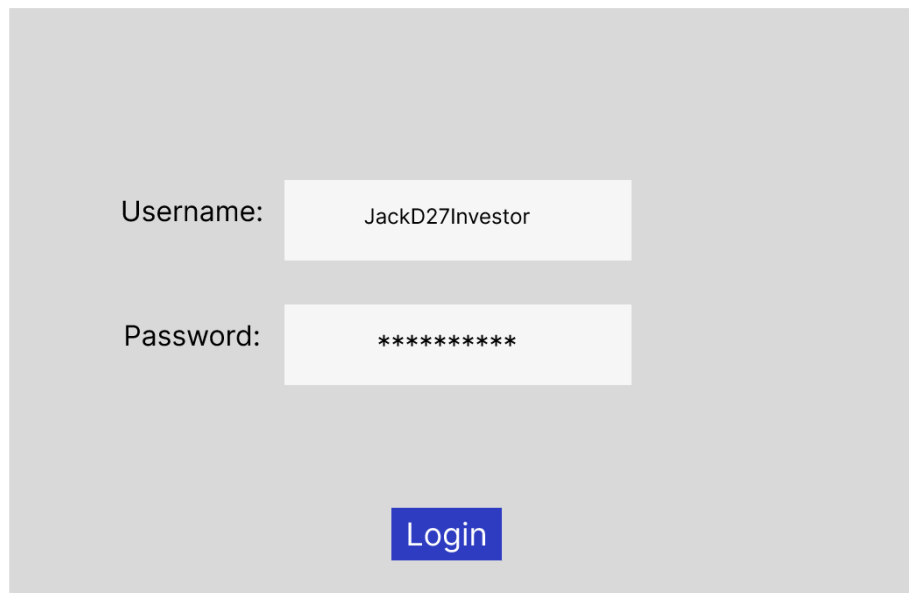
Email: jdaviskid27@yahoo.com

Password: *****

☒ Investor?

Sign Up Login

Moneyypad



A simplified login form for Moneyypad. It features a light gray background. The form includes fields for Username (JackD27Investor) and Password (masked with asterisks). Below the password field is a blue 'Login' button.

Username: JackD27Investor

Password: *****

Login

Yearly Income: \$92,000

After Taxes: \$67,355



Recurring Expenses

[+](#)

Amazon Prime \$15 Oct 9, 2022 WANTS

Spotify \$10 Oct 1, 2022 WANTS

Mortgage \$1,200 Sep 20, 2022 NEEDS

Car Bill \$667 Aug 16, 2022 NEEDS

Sum: \$1,892 Monthly

Recent Transactions

[+](#)

Market Basket \$120 Oct 9, 2022 NEEDS

Spotify \$10 Oct 1, 2022 WANTS

Stock Market \$60 Sep 20, 2022 SAVINGS

Amazon \$52 Aug 16, 2022 WANTS

Recommendations

Max Car Price: \$32,000

Max House Price(30yrs, 20k down): \$381,549

Notifications

Low Balance

Search: AAPL

AAPL
Apple Inc

\$140.42

+0.24%

Watchlist

[+](#)

Apple Inc \$140.42 Oct 9, 2022 +.24%

Spotify \$85.97 Oct 1, 2022 -2.32%

Walmart \$129.32 Sep 20, 2022 +.59%

Amazon \$113.67 Aug 16, 2022 -.78%

My Portfolio

[+](#)

Apple Inc \$140.42 Oct 10, 2022 2 Shares \$140.42

Spotify \$80 Oct 1, 2022 1 Share \$85.97

Amazon \$110 Sep 20, 2022 2 Shares \$113.67

Apple Inc \$18 Aug 6, 2012 1 Share \$140.42

Total: 734.15 Profit: 136.15

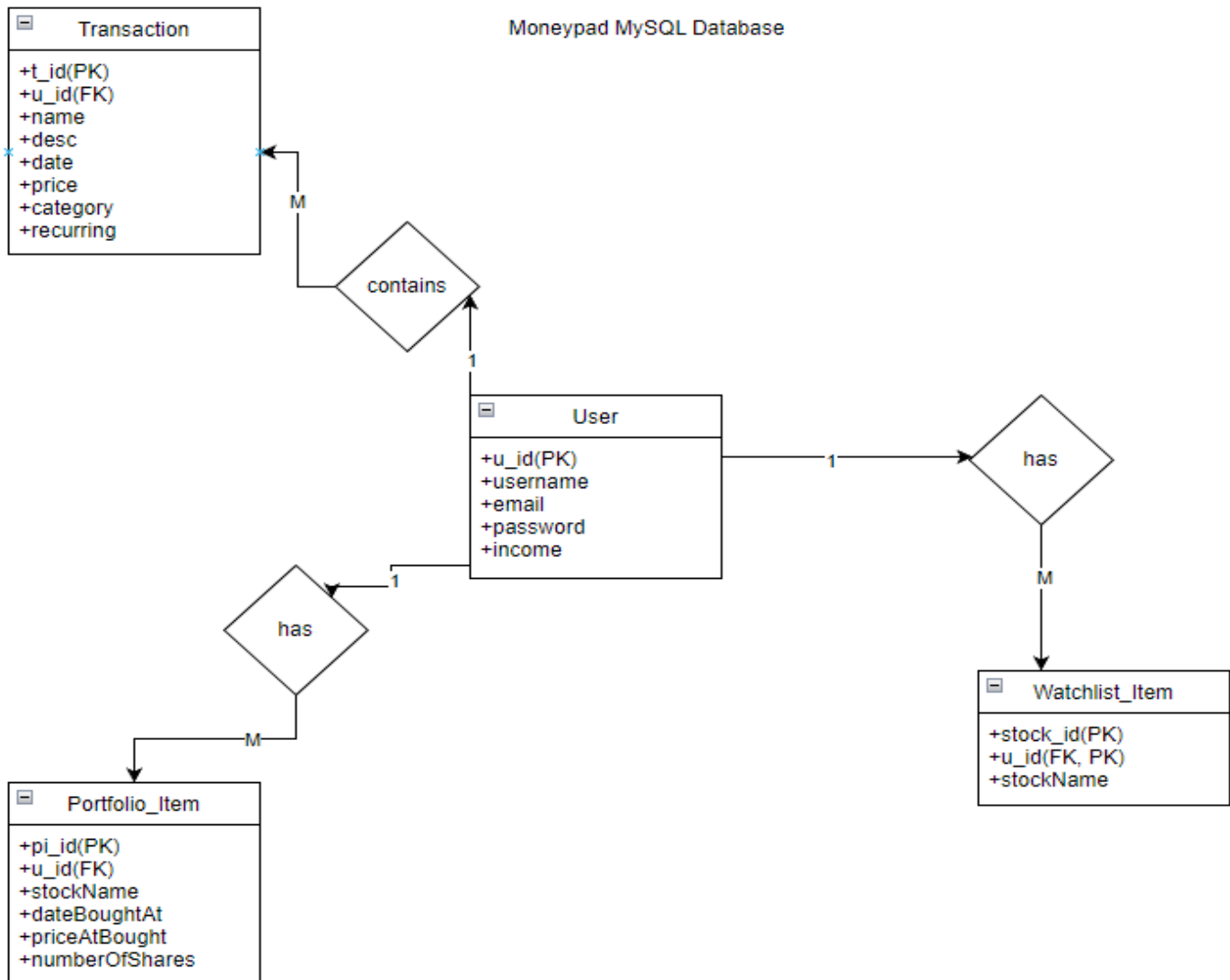
Recommendations

Buy AAPL
Sell META

Notifications

Federal Reserve Speech Coming Up!

Preliminary Database Design



One User contains many transactions. One User has many watchlist items. One user has many portfolio items.


CSC521 Supervisor Selection

CSC 520

Supervisor Selection for CSC 521

Student – Supervisor Agreement

I / We	Jackson Davis	would like to request
Faculty	Prof. Allan Brockenbrough	
to supervise my/our following capstone project in CSC521		
Project Title	Personal Finance Web App (Moneypad)	
Problem Description	<p>This project will try to help people with their personal finance issues, help with receiving recommendations of ways they should invest into stocks based on their own style of investing. You can see recent transactions and upcoming bills to keep you up to date on any payments you need to do. The user or investor will be able to access this app from a website. They will have to create an account and use it to log in, to see their dashboard of investments, spending, transactions, budgeting, and recommendations from the developer.</p> <p>When registering an account, the user will be asked if they are an investor and will also be asked their monthly income/yearly income. The user will be able to set and see recent transactions to keep everything up to date. They can set budgets for the month and see recommendations of budgeting from the developer. They can set bills that are to be paid every two weeks, monthly, yearly etc. So they can keep up to track on that and receive notifications when the date is near of the bill being due. You can also see what you're spending your money on, which is similar to recent transactions.</p> <p>If the user picks that they're an investor, they will get a new role and be able to see all the stuff to do with investing. The investor can see the prices of certain stocks that they input. They can set their stock portfolio, so they can keep track of it and see how much it has grown since they bought a certain stock from awhile ago. They will get recommendations from the developer based on their type of stock trading. If they're conservative, they will get safe stocks to invest in. If they're risk-takers, they will get risky stocks to invest in, but can provide a big return. It can also provide a huge loss as well.</p> <p>This app is good for anyone to keep track of their finances, to receive notifications for upcoming bills and get an insight of what to spend based on your income so you don't have to go into debt. While investors can also get notifications from changes in their stock portfolio and keep up to date on changes in the stock market. Investors will also get a nice insight from the developer on what to spend on stocks and put them into based on the investor's strategy.</p>	
Signatures Section		

Student(s) Signature(s):		10/13/2022
CSC521 Supervisor signature:	Allan Brockenbrough	<u>10/17/2022</u>

Benchmark Specification

Benchmark 1: Database Setup and Testing

Benchmark 2: User Signup/Login and Testing

Benchmark 3: Transaction Service and Testing

Benchmark 4: Stock Service and Testing

Benchmark 5: GUI Design

Benchmark 6: Notification/Recommendation System and Testing

Benchmark 7: Integration Testing

Tools for Implementation

Programming Languages: Javascript

IDEs: Visual Studio Code (VSC)

Backend: Node.js, Express

Frontend: React-Bootstrap, CSS

Database: MySQL

Operating System(s): Windows 10

Project Management Tool: Trello - <https://trello.com/b/cE22K4xL/jacksons-capstone-project>

Source Control Tool: Github - <https://github.com/JackD27>

Time Schedule / Grading Scheme for CSC 521

Database Setup: (1 weeks) (10 pts)

User Signup: (2 weeks) (10 pts)

Transaction Service: (2 weeks) (15 pts)

Stock Service: (3 weeks) (20 pts)

GUI Design: (3 weeks) (20 pts)

Notification System: (2 week) (10 pts)

Integration Testing: (1 week) (5 pts)

521 Presentation: (10 pts)

Deliverables for CSC 521

- Amendments to the proposal.
- All design diagrams (e.g., UCD, DFD, ERD, etc.) updated/enhanced with details determined during the implementation of the project
- Documentation of completed project functionality
- Sample output (e.g., screen shots)
- Executables or URL (if the application is hosted in the cloud)
- Description of the source control tool used for the project implementation
- Project journal
- Project postmortem
- Presentation Document for CSC521

New Updates After this Page

GitHub

<https://github.com/JackD27/CapstoneProject>

Amendments

- Removed search bar from stock page
- Removed notifications from stock page
- Added a feature to be able to click the stock name, that brings the user to Yahoo Finance with information about the stock.
- Added an admin page
- Combined Transactions and Expenses into one component

Postmortem

- Brought a full web app to life from start to finish, frontend and backend.
- I learned how to fetch from public APIs other than ones I created myself
- Learned much more about parent and child components with React
- Gotten much more familiar with JavaScript
- Learned much more about a SQL database
- Learned how to host a website and how to host a server online as well.

Project Functionality

