

# Stock App Project Summary

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# 1 Project Overview

- Fully functional stock app with a fake-money portfolio and real-time performance tracking
- Backend in Python using Finnhub for market data, hosted on Render
- Firebase authentication for user account management and cross-device data persistence
- Frontend built with React and CSS, providing a responsive and intuitive interface

Our team came together to build a stock tracker that lets users buy virtual shares and monitor both individual stock performance and overall portfolio value. The backend service, written in Python and powered by Finnhub, runs on Render and handles all market data requests. To ensure users can access their portfolios from any device, we integrated Firebase authentication and database services, securely saving user data across sessions.

The user interface is implemented in JavaScript with React and styled using CSS, emphasizing clarity and responsiveness. Users can search for stocks, add them to their portfolio, and view detailed charts and summaries. Under the hood, API calls are optimized for speed and reliability, and the frontend components are modular to facilitate easy maintenance and future feature additions.

This project represents a complete, end-to-end application developed over five sprints, demonstrating our ability to collaborate, adapt technologies, and deliver a polished product ready for deployment.

## 2 Sprint Reports

### 2.1 Sprint 1: March 17–25, 2025

**Team Effort:** RCM

**Overview:** In this sprint, the team designed the core user flows and implemented the initial feature set, including the four primary pages and API integration.

**Objectives:**

- Implement Home, Stock, Portfolio, and Settings pages with navigation.
- Integrate the backend API to fetch and display real-time stock data.
- Enable adding and removing stocks in the portfolio.

**Inputs:**

- *Value Propositions:* The app must be easy to use and understand.
- *User Narratives:* The app should feel intuitive and helpful, not merely functional.
- *UI Components:* Add/remove stocks in portfolio, view stock performance, set notifications.

**Implementation Highlights:**

- **Backend:** Python Flask service using `yfinance`, deployed on Render. API endpoint: `/stock?symbol=<SYMBOL>`.
- **Frontend:** React app with routed pages; navigation bar for page transitions; functionality to display stock details and manage portfolio items.

**Results and Next Steps:**

- Completed end-to-end data flow and core navigation.
- Deferred detailed UI styling of Home/Settings to Sprint 2.
- Next: refine UX/UI and implement persistent storage for portfolio.

## 2.2 Sprint 2: March 20—April 1, 2025

**Team Effort:** RCM

**Overview:** In this sprint, the team defined the app architecture, built out the Home and Settings pages, and enhanced the backend to support multi-symbol queries and 30-day historical data. :contentReference[oaicite:0]index=0:contentReference[oaicite:1]index=1

**Objectives:**

- Implement Home page with app title, description, and “Top 5” stocks chart.
- Build Settings page featuring light/dark theme toggle, FAQ section, and font-size control.
- Refactor backend API to accept comma-separated symbols and return historical price arrays.
- Organize GitHub repo structure for improved clarity and collaboration.

**Implementation Highlights:**

- **API Enhancements:** Flask endpoints updated for multi-symbol support and 30-day history, with updated JSON schema.
- **Frontend:** Home page populated with Top 5 placeholder chart; Settings page skeleton with theme switcher; global CSS variables for light/dark modes.

**Results and Next Steps:**

- Completed core architecture and page skeletons.
- Backend now supports multi-symbol queries and historical data.
- Next: wire up interactive charts, finalize Settings UI, and persist user preferences.

## 2.3 Sprint 3: April 1–8, 2025

**Team Effort:** RCM

**Overview:** In this sprint, the team designed the system architecture and implemented core data-management components, coding the initial row of prioritized user activities and improving portfolio and settings functionality. :contentReference[oaicite:0]index=0:contentReference[oaicite:1]index=1

**Objectives:**

- Develop backend data-management modules (hidden component/page) for robust stock retrieval.
- Enhance Portfolio page to support fractional share purchases and multiple-stock entries.
- Implement fictional “play money” simulation on the Home page for prototype testing.
- Refine CSS styling and propagate the light/dark theme across all pages.
- Update Settings to apply improved theming and usability globally.

**Implementation Highlights:**

- **Backend:** Introduced new API endpoints for bulk and fractional-share data handling, with updated JSON schema. :contentReference[oaicite:2]index=2:contentReference[oaicite:3]index=3
- **Frontend:** Added play-money simulation component, reworked CSS framework, and extended theme toggle to all UI components.

**Results and Next Steps:**

- Portfolio now allows fractional buys and persists across sessions.
- Settings theme improvements live; pending portfolio gain/loss summary and enhanced Stock-page navigation.
- Next: implement portfolio gain/loss visualization, finalize endless-scroll sections on Stock page, and add back-button navigation.

## 2.4 Sprint 4: April 8–17, 2025

**Team Effort:** RCM

**Overview:** In this sprint, the team enhanced the portfolio and settings pages, implemented the fake-money simulation on the Home page, and integrated Firebase authentication and Alpha Vantage data into the backend. :contentReference[oaicite:0]index=0:contentReference[oaicite:1]index=1

**Objectives:**

- Fix portfolio removal functionality and calculate overall gain/loss.
- Add fake-money simulation display on the Home page.
- Enhance Settings with font-size control and FAQ dropdown.
- Integrate Firebase authentication and Alpha Vantage API for extended stock data.

**Implementation Highlights:**

- **Backend:** Added Firebase auth middleware; integrated Alpha Vantage endpoints to fetch additional stock fields.
- **Frontend:** Updated Portfolio UI for removal and gain/loss display; added Home-page fake-money widget; improved Settings with dynamic font size and collapsible FAQ.

**Results and Next Steps:**

- Portfolio and Settings pages are fully improved.
- Backend now authenticates users and retrieves enhanced data.
- Next: create architecture diagram, implement gain/loss trend charts, and secure end-to-end auth flows.

## 2.5 Sprint 5: April 17—24, 2025

**Team Effort:** RCM

**Overview:** In this sprint, the team finalized the architecture and polished core features—adding portfolio gain/loss calculations, integrating the fake-money simulation, building the login page, refining UI/CSS, and enhancing backend persistence. :contentReference[oaicite:0]index=0:contentReference[oaicite:1]index=1

**Objectives:**

- Display portfolio-wide gain/loss metrics.
- Embed fake-money simulation on the Home page.
- Implement user login page with authentication.
- Apply CSS refinements (borders, line spacing, background accents, button placement, overflow handling).
- Integrate Firebase authentication and persist portfolio data to prevent loss.

**Implementation Highlights:**

- **Backend:** Added Firebase auth middleware and a persistence layer to save user portfolios across sessions. :contentReference[oaicite:2]index=2:contentReference[oaicite:3]index=3
- **Frontend:** Created login component, hooked up fake-money module, fixed dark-mode search bar styling, improved back-button navigation, and polished overall UI.

**Results and Next Steps:**

- Completed end-to-end login and data persistence.
- Portfolio gain/loss and fake-money features are live.
- Next up: assemble demo environment, perform user acceptance testing, and finalize project documentation.

## 3 Sprint Slides

### Slides Overview

- Sprint 1 Slides
- Sprint 2 Slides
- Sprint 3 Slides
- Sprint 4 Slides
- Sprint 5 Slides

## 3.1 Sprint 1 Slides

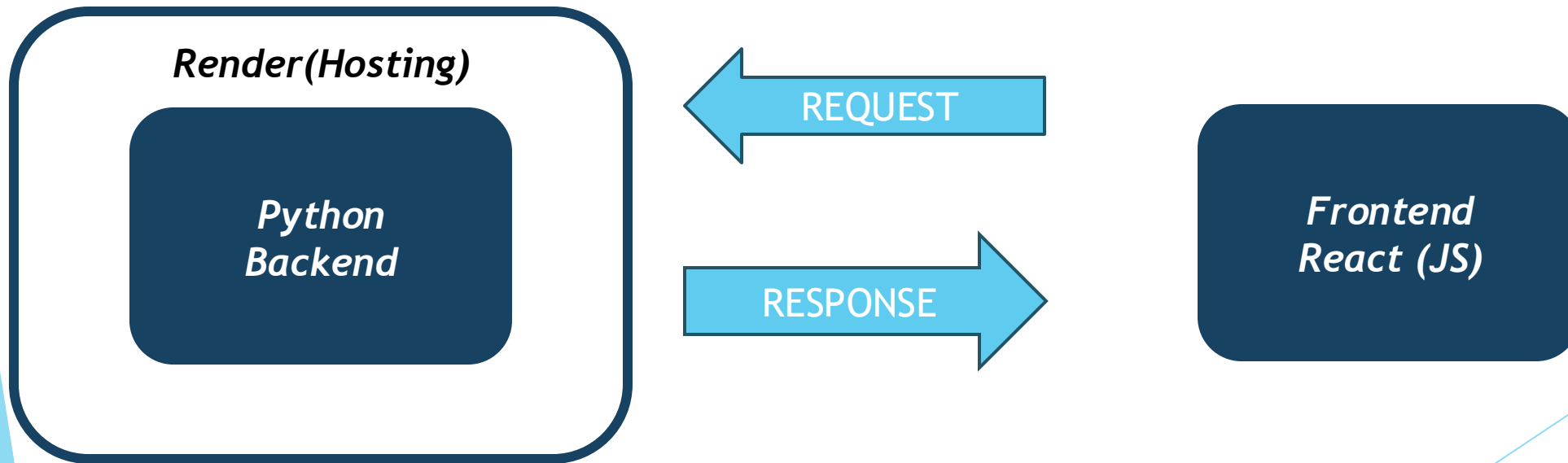
# First Sprint

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond

# Back-End

Python for requesting stock data from yfinance. Which is then "wrapped" in render, our hosting application. Front end is made with react (js)





# Back-End: Current Development

Backend handles one stock per API call (20 stocks = 20 calls). Can be slow, but most important, it works!

**API Site link:**

<https://stock-api-2rul.onrender.com/>

**API How to use and example use:** Argument taken as processed is AFTER the "=" sign at the end.

<https://stock-api-2rul.onrender.com/stock?symbol=NVDA> returns Nvidia stock information

<https://stock-api-2rul.onrender.com/stock?symbol=AAPL> returns Apple's stock information

# Back-End: Future Plans

**Multi-Stock Requests:** Consider an endpoint that accepts multiple symbols (Ex.) `/stocks?symbols=NVDA,AAPL,TSLA` to reduce HTTP overhead.

**Data Size:** Even 50,000 words (~500 KB) is manageable due to text compression and common server limits. So, we should be able to get away with larger data requests from the server.

**Scalability & Real-Time Updates:** Perhaps fetch stocks in batches (Ex.) 20 at a time), perhaps with lazy loading. Perhaps use an intermediate read-only database to serve frequent requests and reduce API calls.

**Additional Considerations:** Implement rate limiting and caching strategies to prevent overwhelming the API (realistically, not need for this project, but you may never know)

# The pages we have created

There are four pages with the same navigation bar.



# Connecting React Frontend to the API

**API Endpoint & JSON Data:** The Flask backend exposes an endpoints (Ex. /stock?symbol=NVDA) that returns stock data in JSON format. JSON data includes essential fields like symbol, name and current price.

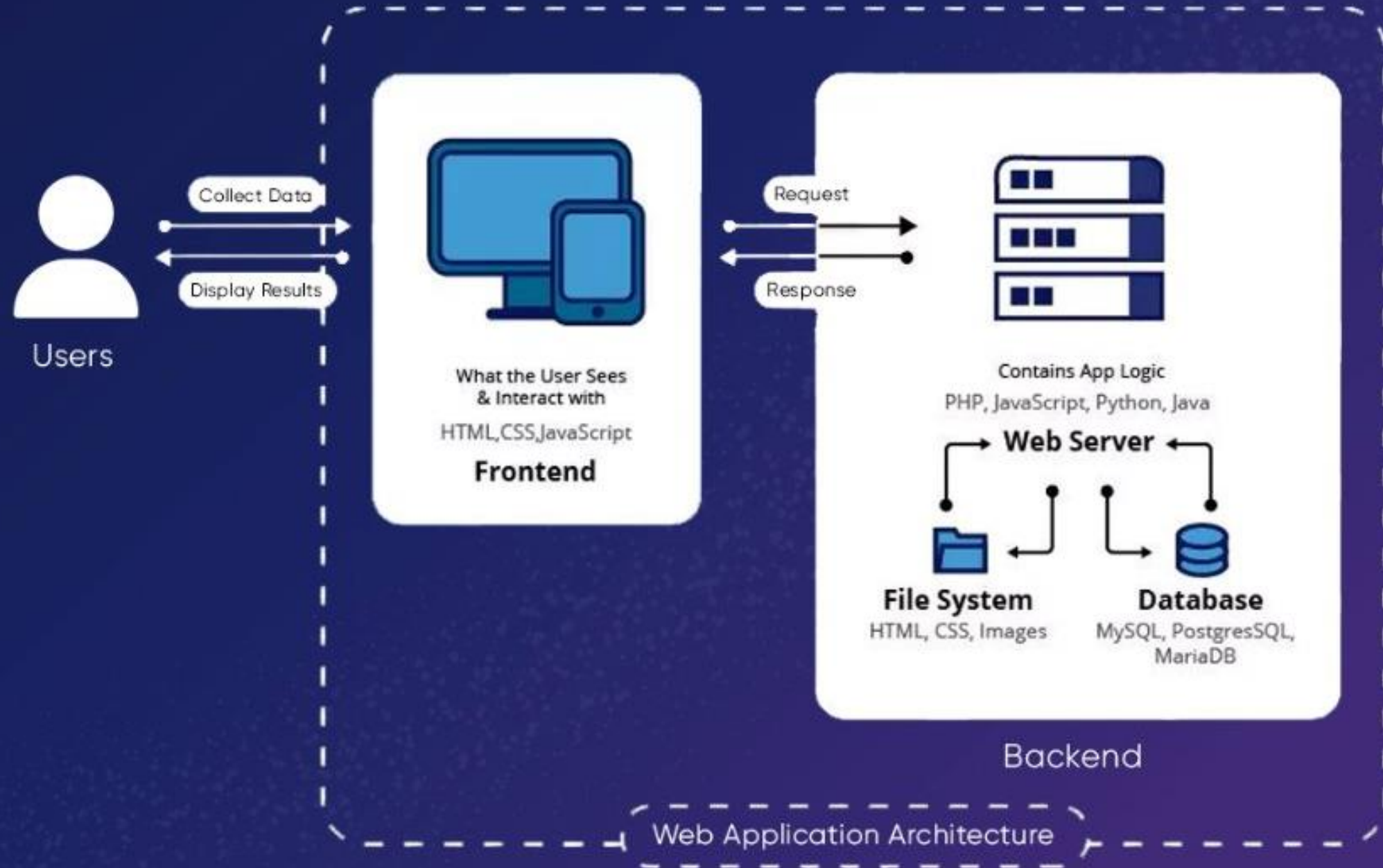
**HTTP Request Using Fetch:** The React frontend uses the fetch() method to make an HTTP GET request to the API endpoint.

NVIDIA Corporation (NVDA)

\$118.4789

BUY

# WEB APPLICATION ARCHITECTURE



# Future connection plans

**API Security:** Currently, the API endpoint is public; implement authentication to restrict access.

**Code example of how it is currently done:** Anybody with the link could spam the API for calls over and over if they wanted.

```
*****
```

```
fetch("https://stock-api-2rul.onrender.com/stock?symbol=NVDA")  
  .then(response => response.json())  
  .then(data => console.log("Stock Data:", data))  
  .catch(error => console.error("Error fetching stock data:", error));
```

```
*****
```

Simple test code, prints current API call to console

## 3.2 Sprint 2 Slides

# Second Sprint

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond



# Our Hopes & Dreams: Part 1

What we wanted to get done:

- ▶ **Home Page:**

- ▶ Displays app title and introduction.
- ▶ Implement an endpoint for the Top 5 performing Stocks, defined by the highest % increase in the last 30 days.

- ▶ **Settings:**

- ▶ Light/Dark theme toggle.
- ▶ FAQ/Help section.
- ▶ Adjustable font size.

# Our Hopes & Dreams: Part 2

What we wanted to get done:

- ▶ **API Enhancements:**

- ▶ Add a method to fetch multiple stocks
- ▶ Add the history of the stock of the past 30 days

- ▶ **GitHub Organization:**

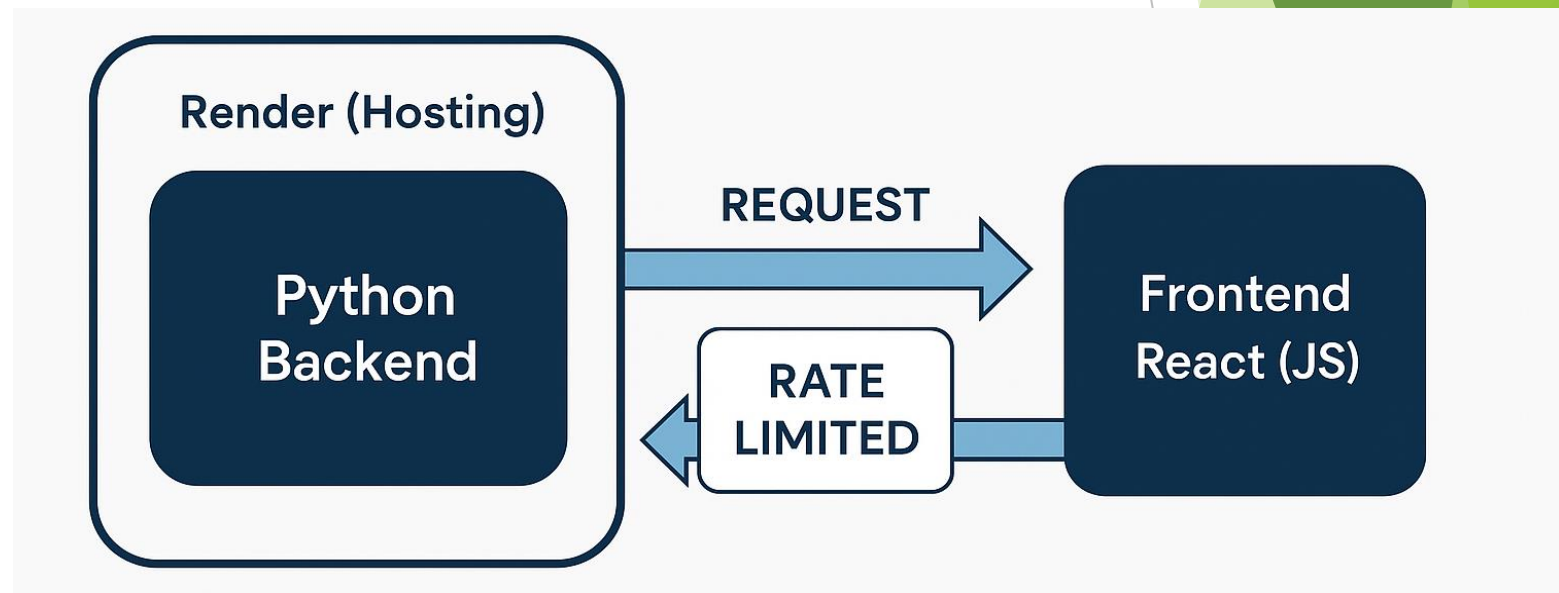
- ▶ Improve repository structure for better collaboration and clarity.

# Back-End: The Harsh Reality

What We Did with the Backend:

- ▶ Enabled multi-stock requests (Ex. /stock?symbol=AIRS,AAPL).
- ▶ Integrated retrieval of the last 30 days of stock history.
- ▶ Returned key data points: symbol, name, current price, current date, and history.

```
{  
  "current_price": 222.13,  
  "date": "2025-04-01 05:48:16",  
  "history": [... ],  
  "name": "Apple Inc.",  
  "symbol": "AAPL"  
}
```



# Future Backend Enhancements

- ▶ **Address yfinance rate limits:** Hard-coding a complete stock list isn't scalable. Implement lazy loading (Ex. 20 stocks per request) to manage performance.
- ▶ **Explore using a database or caching layer to store data:** Reduce frequent calls to yfinance. Improve response times for high-volume requests.
- ▶ **Consider alternative APIs or combining data sources:** yfinance alone doesn't support fetching the entire stock universe. Organize our own database to maintain a comprehensive ticker list.



# Future Backend Enhancements

- ▶ **API Security:** Currently, the API endpoint is public; implement authentication to restrict access.
- ▶ **Develop additional endpoints:** Different endpoints for minimal info (e.g., only name) versus detailed data.

# Home Page: Current Developments

- ▶ The title of the App
- ▶ Shows 5 cool stocks (generic stocks) with stats
  - This is formatted with some CSS to look good!
- ▶ Display the description of the App

**1. Apple Inc. (AAPL)**

**Current Price:** \$222.13

**Date:** 2025-04-01 06:59:14

**30-Day Change:** -9.14%

# Home Page: Future Developments

- Find a solution to allow the stocks to be pulled much more often and to actually determine the best stock there is out there in terms of % rising. (more of an api thing)

# NVIDIA Corporation (NVDA)

Current Price

\$108.38

Last Updated

2025-04-01 04:28:28

Price History (Last 30 Days)



Home

Stocks

Portfolio

Settings

## Stocks Info - Charts



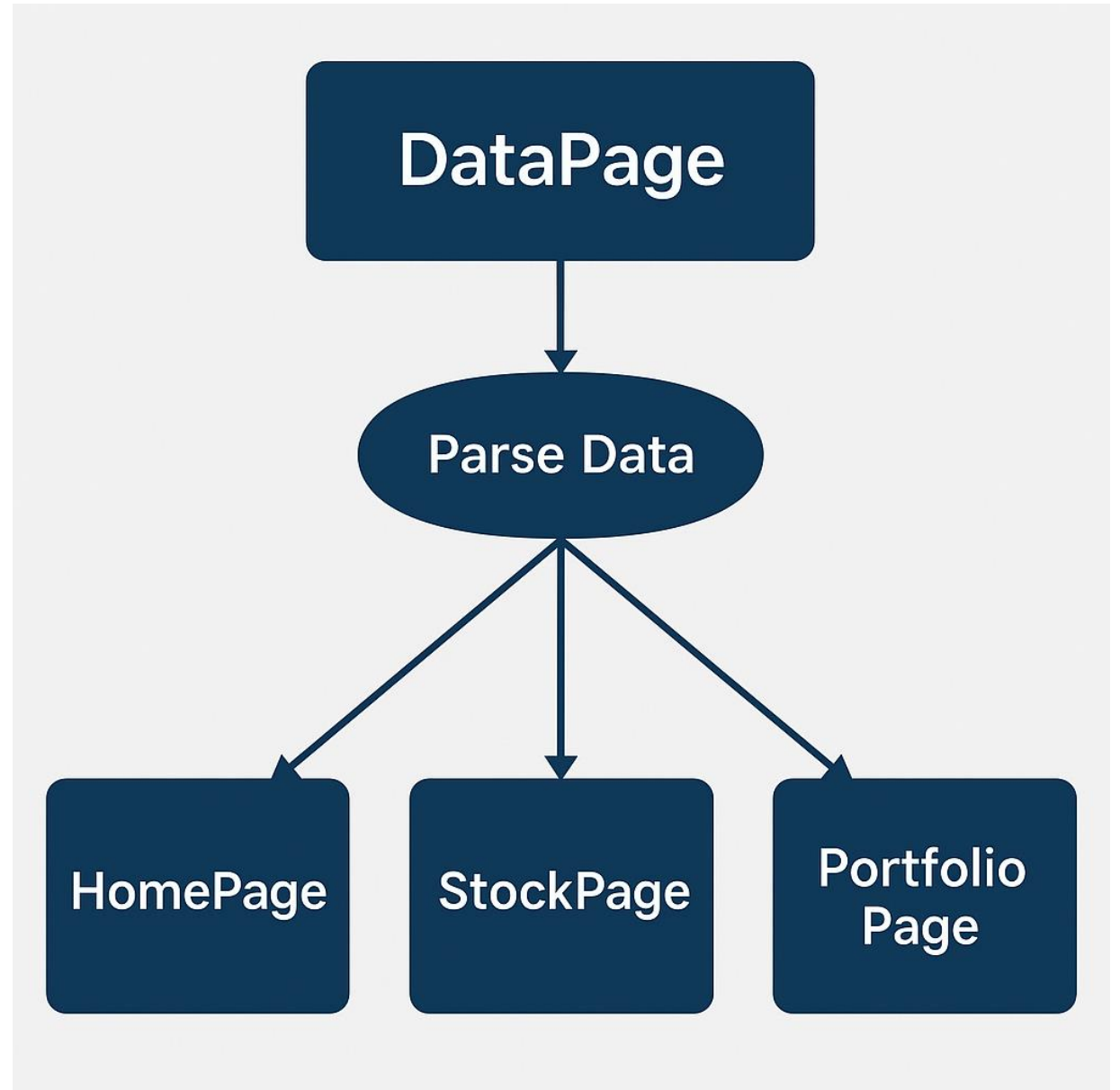
# Settings: Current Developments

Worked on:

- ▶ Getting the Light/Dark theme
- ▶ The FAQ/help

# Overall future ideas

- ▶ Currently, each component is responsible for fetching and processing its own data. To increase efficiency, we could implement a centralized data processing page that handles data parsing for all components, streamlining the process and reducing redundant requests.
- ▶ Continue to work on each of the pages adding the features we want



### 3.3 Sprint 3 Slides

# Third Sprint

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond

# Our Hopes & Dreams

What we wanted to get done:

- ▶ **Stock Page:**
  - ▶ Fictional money
  - ▶ buy fractions of stocks
- ▶ **Settings:**
  - ▶ Light/Dark theme toggle fix.
- ▶ **Integrate a better API:**
  - ▶ Use an API that allows us to see more stocks and has more features such as an auto fill (alpha vantage).
- ▶ **CSS:**
  - ▶ Improve Formatting.

# Back-End: The Harsh Reality

- ▶ **Started Firebase Integration Beginnings**

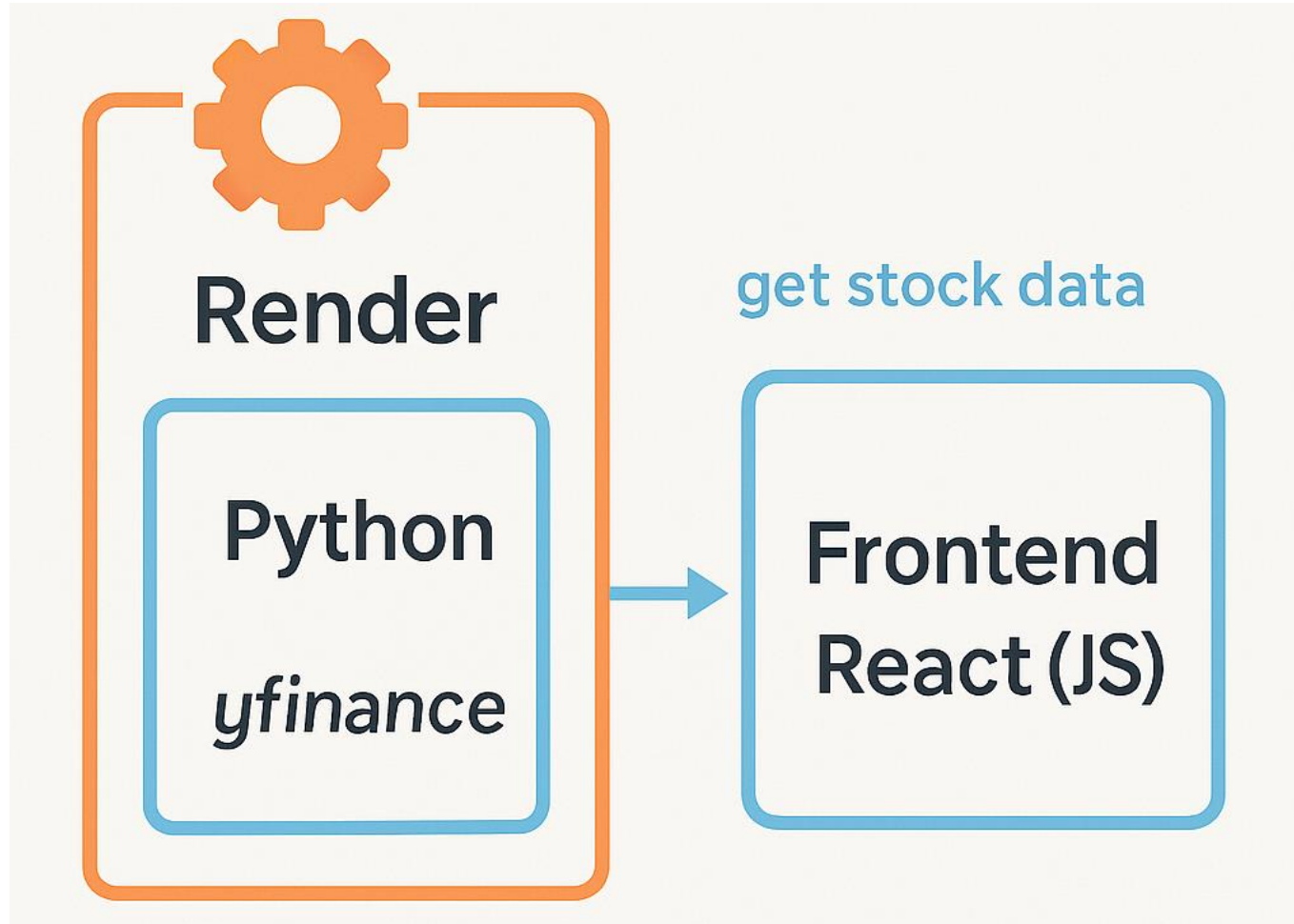
- ▶ Started integrating Firebase into the app's backend.
- ▶ Explored both Node.js and Python Cloud Functions to fetch and cache stock data (went with python)

- ▶ **Started Firestore Setup**

- ▶ Configured Firestore and deployed a sample function to write dummy stock data.
- ▶ Learned to use environment configuration (via Firebase CLI and environment variables) to manage API keys securely.

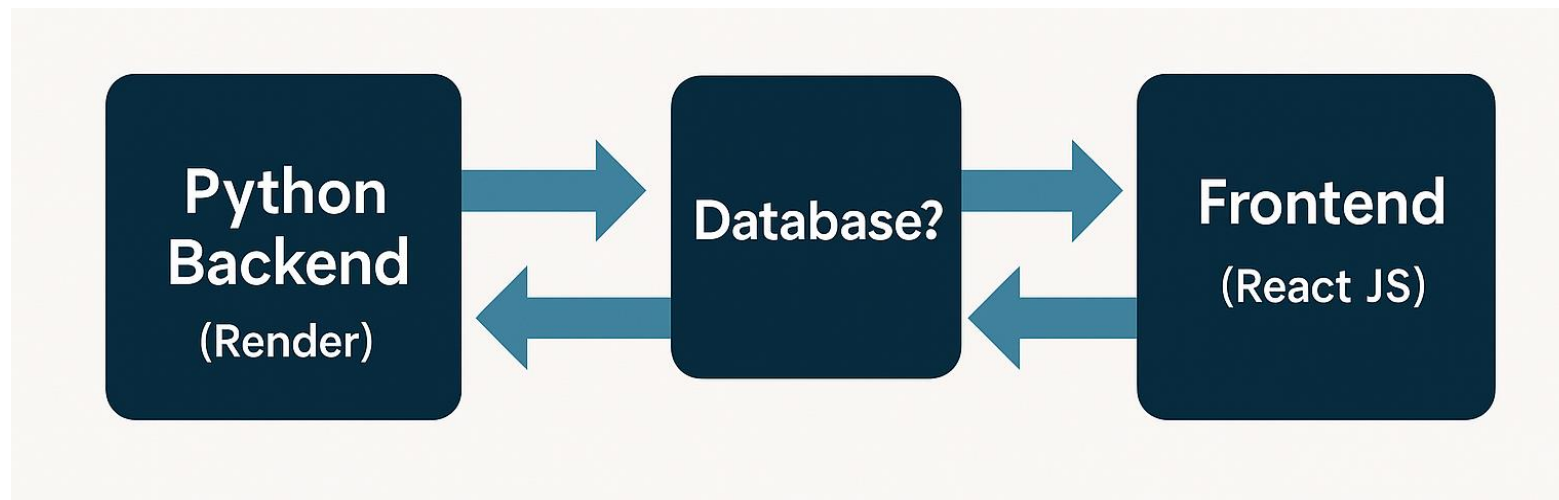
All this lives on a private server for now, as we still use "legacy" code which would be yfinance. Another note is this can all be simply moved over to "render" however we wanted to minimize the number of applications we use (React, Render, python, firebase)

# Back-End: The Harsh Reality



# Future Backend Enhancements

- ▶ **Finalize stock info:** We have figured out that alpha vantage is pretty good! Perhaps we'll add a database for caching or use a combination of both yfinance and alpha vantage.
- ▶ **Firebase authentication:** We need to store people's portfolios at some point since we are a web-app and do not have local storage.

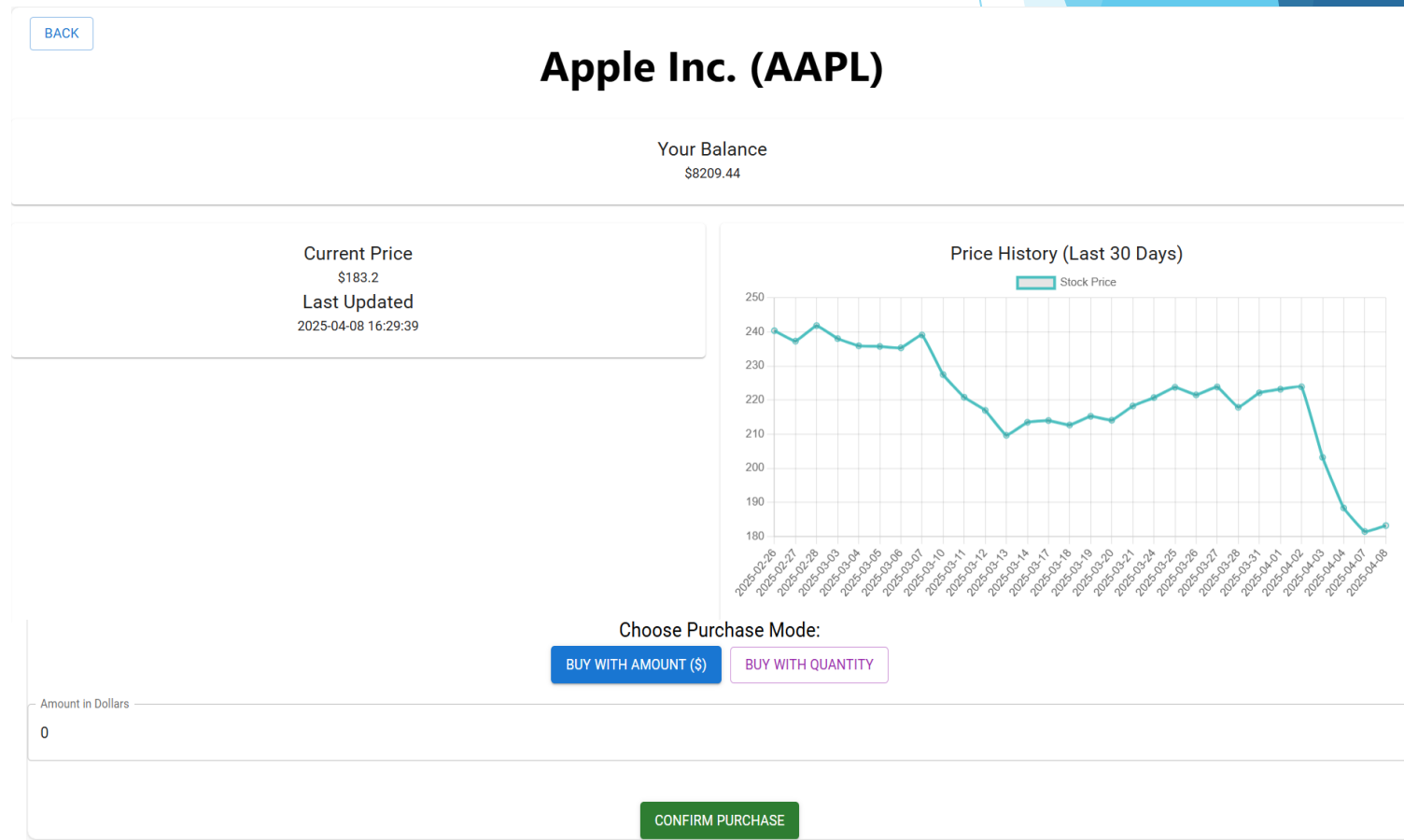




# Stock Page: Current Developments

Worked on:

- ▶ We can buy stocks with fictional money
- ▶ We can buy fractions of stocks



# Settings: Current Developments

Worked on:

- ▶ The light and dark theme got broken. Fixed the Light/Dark theme

# CSS: Current Developments

Worked on:

- ▶ Got some CSS styling for the pages. Examples are text-align, margin, and font-family

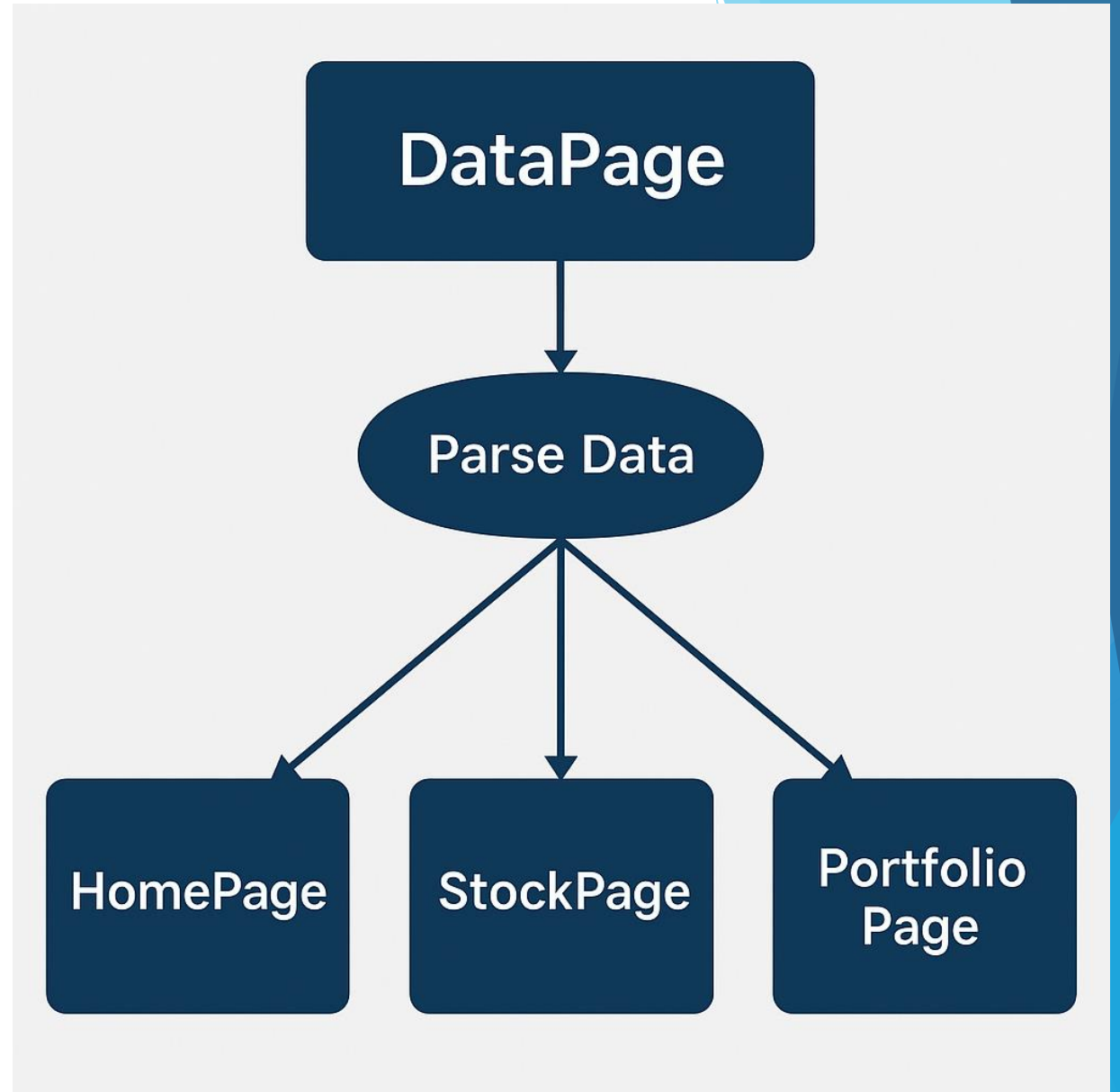
# Future Developments

Want to work on:

- ▶ **API Security:** Currently, the API endpoint is public; implement authentication to restrict access.
- ▶ **Portfolio:**
  - Gain/loss of all of portfolio
  - save portfolio so it does not disappear
- ▶ **Stock page:**
  - Method of presentation on stock page (EndLess scroll and sections)

# Overall

- ▶ Currently, each component is responsible for fetching and processing its own data. To increase efficiency, we could implement a centralized data processing page that handles data parsing for all components, streamlining the process and reducing redundant requests.
- ▶ Continue to work on each of the pages adding the features we want



## 3.4 Sprint 4 Slides

# Forth Sprint

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond

# Our Hopes & Dreams

What we wanted to get done:

- ▶ **Portfolio Page:**

- ▶ Fix the portfolio's get rid of stock, Gain/loss of all of portfolio\*

- ▶ **Settings:**

- ▶ Font Size in Settings, FAQ dropdown

- ▶ **Backend:**

- ▶ Add firebase, add alpha vantage, allow more info and change how info is to be requested. Fix the errors that occur when changing what the backend sends to the front end.

- ▶ **Home page:**

- ▶ Put in the fake money to buy stocks

# Back-End: The Harsh Reality

- ▶ **Endpoint NEW format (kept render):** `/stock?symbol=<function>:<parameter>`
- ▶ **Functions**
  - ▶ **Autocomplete (via finnhub)**
    - ▶ Usage example: `/stock?symbol=autocomplete:AAP`
    - ▶ Returns up to 50 matches, each including: symbol, displaySymbol, description, type (Ex. Common Stock, ETP, Crypto, etc.)
  - ▶ **yfinance**
    - ▶ Usage example: `/stock?symbol=yfinance:AAPL,MSFT`
    - ▶ Returns detailed stock info for each symbol, including: company name, current price, timestamp, 30-day closing-price history
- ▶ **How it works**
  - ▶ The word before the colon (autocomplete or yfinance) selects which function to run.
  - ▶ Everything after the colon is passed as the search term or list of tickers.
  - ▶ Results are returned as JSON arrays, ready for the front end.



# Future Backend Enhancements

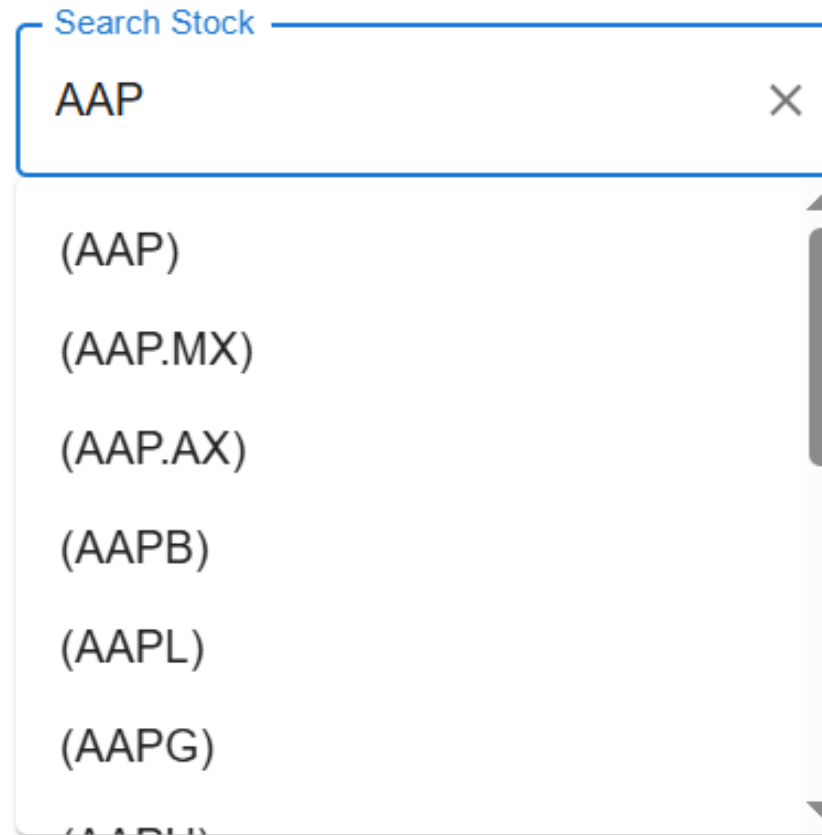
- ▶ **Returning more info:** We have returned company name, current price, timestamp, 30-day closing-price history. We can look at what else we can return so people can make decisions regarding stock.
- ▶ **Firestore authentication:** We need to store people's portfolios at some point since we are a web-app and do not have local storage. This will be added via firestore, we will no longer be considering using firebase functions for hosting our functions/API, only for authentication and profile storage.



# Stock Page: Current News

Worked on:

- ▶ **Autocomplete Feature:** Added the functionality of the autocomplete from the API. Typing a letter will return up to 50 potential matching stocks.
- ▶ **Preview button:** Now able to "preview" stocks as since you get just the name of a stock from the auto complete now you get the.



A screenshot of a web application's stock search feature. At the top, there is a search bar with the placeholder text "Search Stock" and a close button (X). Below the search bar, a dropdown menu is open, displaying a list of stock symbols that start with "AAP". The list includes "(AAP)", "(AAP.MX)", "(AAP.AX)", "(AAPB)", "(AAPL)", and "(AAPG)". A vertical scrollbar is visible on the right side of the dropdown menu, indicating that there are more results than are currently visible.

# Settings: Current Developments

Worked on:

- ▶ Font Size in Settings, when you click the button the paragraphs font size gets bigger
- ▶ We turned the FAQ into a dropdown, just have to hover over the question
- ▶ (all of this is shown in the demo)

# Portfolio Page: Current Developments

Worked on:

- ▶ The portfolio's get rid of stock got broken. Fix the portfolio's get rid of stock (simple bug fixes!)

# Home: Current Developments

Not worked on:

- ▶ Did not have time to put in the fake money

# Future Developments

Want to work on if we have time and decide which is more important:

- ▶ **API Security:** Currently, the API endpoint is public; implement authentication to restrict access.
- ▶ **Portfolio:**
  - ▶ Gain/loss of all of portfolio
  - ▶ save portfolio so it does not disappear (more of an api thing)
  - ▶ Fake money and add it to the other pages
- ▶ **Stock page:** Method of presentation on stock page (EndLess scroll and sections)
- ▶ **Settings Page:** Ensure all aspects of dark mode, work, such as with the home screen, and with the dropdown menu

### 3.5 Sprint 5 Slides

# Fifth Sprint: Home Stretch

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond

# Our Hopes & Dreams Part 1

What we wanted to get done:

- ▶ **Log in Page:**
  - ▶ Create the page, and Link the page to home page
  - ▶ Make it start in this page
  - ▶ Find logo and less bear page
- ▶ **Portfolio Page:**
  - ▶ Gain/loss of all of portfolio
  - ▶ Adding fake money
- ▶ **Backend:**
  - ▶ Add firebase for log in page

# Our Hopes & Dreams Part 2

What we wanted to get done:

- ▶ **Stocks Page:**

- ▶ Fix lazy pull, Most popular stocks just show up
- ▶ Paraph below title about how the Search works

- ▶ **CSS:**

- ▶ Make sure everything shows when it is the two different fonts and two different modes
- ▶ Decorate the site



# Back-End: Final goals

- ▶ **Firestore authentication (Working Integration):** We need to store people's portfolios at some point since we are a web-app and do not have local storage. This will be added via firestore, we will no longer be considering using firestore functions for hosting our functions/API, only for authentication and profile storage.
- ▶ **Sign-in/Log-in:** With firestore came an overhaul in the Log In page, with the addition of a sign in Page where the user can make an account

# Log In Page: Current Developments

Worked on:

- ▶ Create the page
- ▶ Link the page to home page
- ▶ Make it start in this page
- ▶ Needed a signin page to let users sign up

# Portfolio Page: Current Developments

Worked on:

- ▶ Gain/loss of all of portfolio
- ▶ Adding fake money
- ▶ Firebase allows for storage of user information

# Stock Page: Current Developments

Worked on:

- ▶ Adding fake money

## CSS: Current Developments

Worked on:

- ▶ Border around pages
- ▶ Line height
- ▶ Background color for some boxes
- ▶ Making sure the buttons don't cover the nav bar
- ▶ border radius
- ▶ Make sure all of dropdowns show for

# Final Developments for Part 2

We want to do this the final week:

- ▶ Log in
  - ▶ Make sure it looks nice
- ▶ Stock
  - ▶ Fix lazy pull, or Most popular stocks just show up, Fix the paragraph below title about how the Search works
- ▶ CSS
  - ▶ Add finishing touches
  - ▶ The search bar in dark mode, Fix back button on the stock buy page so we can see clearly
- ▶ All pages and backend
  - ▶ Finish all last-minute touch ups
  - ▶ Fix all the errors
  - ▶ Check over everything to make sure it works

# Fifth Sprint Part 2

Team RCM

By: Ramiro Gamboa Montes, Christopher Ramirez, Maggie Hemond

# Our Hopes

## ▶ Portfolio

- ▶ Sell stock fix
- ▶ Have firebase store user Data

## ▶ Stock

- ▶ Some stocks just appear
- ▶ Fix the paraph below title about how the Seach works

## ▶ CSS

- ▶ Fix back button on the stock buy page so we can see clearly
- ▶ The search bar in dark mode
- ▶ Add finishing touches

# Our Hopes 2

- ▶ **Sign in page**
  - ▶ Integrate firebase to allow user sign in
  - ▶ Needed a method to allow user sign UP, thus we needed to add a **Sign-Up page**
- ▶ **All pages and backend**
  - ▶ Check over everything to make sure it works

# Stock Page: Current Developments

Worked on:

- ▶ Fix the paragraph below the title about how the Search works

Didn't work on:

- ▶ Some stocks just appear

# Portfolio: Current Developments

Worked on:

- ▶ Sell stock fix
- ▶ Firebase integration to save user data

# CSS: Current Developments

Worked on:

- ▶ In buy, fixed back button on the stock buy page so we can see clearly
- ▶ Fixed the search bar in dark mode



# What we did Part 1

## ▶ **Homepage:**

- ▶ Title
- ▶ News of the latest trending stocks (Have risen in the past 30 days more than 5%)
- ▶ Info (Paragraph describing how stocks work)

## ▶ **Stock Page:**

- ▶ Button Add/remove stocks from portfolios
- ▶ Stock info (Company name and stuff)
- ▶ Search Bar
- ▶ Fake money
- ▶ buy fractions of stocks

## ▶ **Settings:**

- ▶ Light/Dark
- ▶ Font Size
- ▶ FAQ/help

# What we did Part 2

## ► **Portfolio:**

- Gain/loss (Separate Portfolio vs individual stocks)
- Graph
- Remove button (To remove from portfolio)
- Sell for fake money

## ► **Backend:**

- API – find best API for our use
  - Finnhub and yfinance
- Language – HTML/CSS, JS, Python
- Website
- Return what information we need for graphs and other items
- Cloud servers: Render, Firebase Auth
- Avoid hardcoding API stuff (security)

# What we did Part 3

## ► Sign in/login:

- Added firebase
- Added some css
- User can skip the sign in to test the app
- FOR THE WHOLE APP, added a log out in the top right corner

# What we didn't get done

## ▶ **Stock Page:**

- ▶ Favorite button/list
- ▶ Method of presentation (EndLess scroll and sections)
- ▶ Filter

## ▶ **Settings:**

- ▶ Notifications/alerts
- ▶ Language

## ▶ **Home Page:**

- ▶ Logo

## ▶ **Portfolio:**

- ▶ Filter (Similar to StockPage)
- ▶ Folder/Method to organize specific stocks to make mini portfolios

## 4 User Stories and Personas

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# Aim Statement

## *Summary*

Our goal is to develop a user-friendly stock tracking app designed for beginner investors, providing a clear, jargon-free way to monitor and understand stock performance. The app simplifies stock tracking by offering key insights while keeping the experience intuitive and accessible.

The app will allow users to:

- Track stocks without requiring financial expertise.
- View stock performance trends by comparing current values to previous days, months, or years.
- Add or remove stocks from their portfolio.
- Receive alerts when a stock underperforms for an extended period.
- Access stock details in a simplified format for easier decision-making.

The app will achieve this by connecting to a real-time stock market API, ensuring users have access to up-to-date market data while maintaining a simple and easy-to-navigate interface.

## App Structure & Key Features

### *Starter Page (Home)*

- **Bottom Navigation Bar (AppBar):** Provides quick access to the main sections of the app:
  - Search: Find new stocks not yet in the portfolio.
  - Portfolio: View saved and favorited stocks.
- **Introduction Section:**
  - A brief explanation of how stocks work.
  - A simple guide on how to use the app effectively.

### *Portfolio Page (User's Stocks)*

- Displays all owned stocks in the user's portfolio.
- Shows gains and losses over time.
- Provides performance insights (daily, weekly, monthly trends).
- Allows users to remove stocks from their portfolio.
- Sends alerts when a stock has been underperforming for more than a week.

### *Stock Exploration Page (For Unowned Stocks)*

- Displays stocks that the user has not yet added to their portfolio.
- Includes a brief description of each stock's purpose and industry.
- Shows historical performance (gains/losses over time).
- Provides a button to add stocks to the portfolio.
- Allows users to "favorite" stocks for later reference.
- Includes filtering options to help users find relevant stocks.
- Links to external sources for additional research on a stock.

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## **Simple User Stories**

Story 1:

As a stock investor,

I want to see the current price, net gain/loss, and historical performance of stocks in my portfolio



so that I can track how my investments are performing over time.

Story 2:

As a daily stock investor,

I want to create and manage folders to organize my saved stocks  
so that I can categorize them based on my investment strategies.

Story 3:

As a daily stock investor,

I want a search bar to find specific stocks quickly  
so that I can efficiently manage and analyze my portfolio.

Story 4:

As a daily stock investor,

I want to use preset filters to identify which stocks are worth keeping or selling  
so that I can make informed investment decisions more easily.

Story 5:

As a daily stock investor,

I want to see a real-time calculation of how much I would make if I sell a stock at the current  
price  
so that I can quickly assess potential profits or losses.

Story 6:

As a daily stock investor,

I want to see what the predictions are for the stocks with the last year in mind  
so that I can quickly cut any that are going downhill.

Story 7:

As an investor

I want a secure login system

So that my investment data remains protected

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## List of Potential Personas

**Stock investor** – John – Is an adult man who works in an office and wants to gain more profit from his savings

**Daily stock investor** – Jake – He works in the stock market and wants his investments in a safe place.

**Inheritance** - Richard J. Smith – Comes from a rich family and needs to make sure none are losing him money

**Retirement plans** – Ben – Is a grandparent that wants to make sure his retirement funds lets him do stuff with the kids

**College Funds** – Chad – Is a parent that wants to put his kids through college by saving and investing money

**Student Learning** – Jim – Is a student in college learning about the stock market by having twenty dollars to invest throughout the semester

**Overzealous User** – Zeke – Is an average 9 to 5 worker who “jumps the gun” too often on some decision. Saw that “Game Stop stock” was trending in the news and immediately jumped on board the band wagon

**Our main target: People who work with investments, stock analyst, portfolio managers, financial advisors:**

- Commonalities in psychographics:
  - o Data driven and analytical. Make decisions based on market trends and statistics
  - o Time conscious and focused on being efficient as they value tools that save time
  - o Security conscious, they prioritize financial safety and data privacy
- Commonalities in behavior:
  - o Those that frequently check stock performance and financial news
  - o Make frequent trades
  - o Those looking for assist in decision making on their stocks
- Other commonalities:
  - o Likely to be quite knowledgeable in the field of economics, business or finance
  - o Maybe use other tools to aid them with financial decisions

**Not the main target: Casual investors, retirees, passive income seekers**

- Commonalities in psychographics:

- o More conservative with investments as they prefer long-term stability over short-term gains.
    - o Not as actively engaged in daily market fluctuations.
    - o Less concerned with speed and efficiency, more with how reliable and trustworthy investments can be
  - Commonalities in behavior:
    - o More likely to listen to financial advisors or someone else for decision making
    - o Saving up for long term, such as holding stocks for longer and not trading daily
  - Other commonalities:
    - o May not need the real-time tracking tools, perhaps only want a notification when something big happens
    - o Avoid bigger risk, only investing in “index funds” and “bonds” rather than risky stocks
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## Detailed Persona Jake:



**Problem statement:**

Jake is a 43-year-old stock investor and senior financial analyst as he juggles a demanding job while managing his investments. He recently had a promotion and has since had less time to manually track market fluctuations making it difficult to stay updated on stock performance and potential risks. He needs a method to see his centralized stock portfolio that consolidates all his investments. Perhaps providing real-time updates, automated alerts for sudden market changes, and secure access to sensitive financial data. Perhaps an app with customizable folders for organization, instant profit/loss calculations, and advanced security features like two-factor authentication would allow him to make timely, informed decisions. By streamlining his workflow, this app would help Jake maximize returns, minimize risks, and stay ahead of the world of stock investing.

### **Detailed Persona: Daily stock investor – Jake –**

Jake is 43 and works in the stock market. He wants to ensure that his investments are in a safe and reliable environment, minimizing risks while maximizing returns.

He is moving up in his company, so he is getting more responsibilities and a heavier workload. As a result, he has less time to manually check his investments and track market fluctuations.

Despite his busy schedule, he needs to make sure that at any time the investments that he has are not overall losing value, allowing him to make timely decisions when necessary.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	Jake thinks that it takes too long to check on his investments, with his duties getting larger
<b>Sees</b>	Around Jake's department, most of the investments are in different sites so the process is not streamlined
<b>Feels</b>	Jake feels that he is being overwhelmed with the new responsibilities he has and finding the solution to streamline his work
<b>Does</b>	Jake looks around online for possible apps to use and he also asks his coworkers if they have any suggestions

### **Problem Statement + Alternative w/ Value proposition**

<b>Problem scenario</b>	<b>Current alternative</b>	<b>Value proposition</b>
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Jake must look at a lot of different sites to check on his investments	He checks every site, but it is hard to keep up with all the ways the sites do things differently	Have an app that lets you check on all your investments at once
Jake does not know when something goes wrong in one of his investments	He checks each investment daily, but risks missing sudden changes	Have the app alert him if the investment drops suddenly or if it has not gone up in a while
Jake is concerned about security risks and unauthorized access to his investments	He spreads his investments across different platforms to reduce risk	The app will have better security with 2 step authentications

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## Detailed Persona Chad



### **Problem statement:**

Chad needs a stock portfolio app because he is not an experienced investor and lacks the time to actively monitor the market. He wants a simple and reliable way to track his investments, receive automated updates, and make informed decisions without constantly analyzing stock

trends. Since he prefers stable, long-term investments over high-risk trading, he needs an app that provides clear insights and risk assessments to help him grow his savings efficiently.

### **Detailed Persona: Parent College Funds – Chad–**

Chad is a 31-year-old father of two, living a comfortable middle-class life with his wife. They both work full time, earning enough to cover their daily expenses, but they know that affording college for their kids could be a challenge. While they are financially stable now, they worry about the future and want to build a secure financial safety net for their children's education. Chad has recently started looking into investing to grow his savings, but with limited experience, he finds the process overwhelming. He believes that stocks could be a good option for long term growth, but he doesn't have time to monitor the market like professional investors. He needs an app that makes investing simple, one that helps him track his portfolio, provides clear insights without complicated financial jargon, and allows him to set goals for his kids' college fund. By using an investment app designed for ease of use and financial growth, Chad hopes to secure a better future for his children while balancing the responsibilities of work and family life.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	Chad wants his kids to have a college fund when they are older, so he needs to invest
<b>Sees</b>	Chad sees that things are getting more expensive, so he wants a safety net for his kids
<b>Feels</b>	Chad feels overwhelmed because of work, kids, and trying to get this set up
<b>Does</b>	Chad asks other parents what they are doing to set up a college fund, and looks up tips online

### **Problem Statement + Alternative w/ Value proposition**

<b>Problem scenario</b>	<b>Current alternative</b>	<b>Value proposition</b>
Chad needs long term investments that will last for about 18 years	He is researching options that show good growth, but he does not have the right knowledge and not enough time	The app needs to show the growth of the company over many years to know if it is good

Chad needs to understand what the app is talking about	He is looking up what the old app is showing him, but it is still hard to understand	The app needs to operate without complicated jargon
Chad needs to be updated with progress or when something goes wrong	With his kids and his job, he does not have enough time to check	The app will give him constant short updates that allow him to feel comfortable with the investments

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## Detailed Persona John



**Problem statement:**



John wants to grow his saving by making smarter investment decisions. He spends his free time researching stocks and comparing their performance in Excel, but he finds it tedious and time consuming to track everything manually. To maximize his profits, he needs something that can provide a clear overview of stock performance range from the previous months to about a year allowing him to analyze trends quickly. With the right tools, he'd like to make informed decisions and optimize his investments without having to spend hours compiling the data himself.

### **Detailed Persona: Securing a better future – John–**

John is a 38-year-old office worker who has been careful with his money; however, he is ambitious. He has a stable job and steady income but wants to do more with his saving than just letting it sit in a bank account. Looking to diversity, John has started researching the stock market in his off hours, comparing company stocks in Excel and trying to identify ones that could help him maximize his returns.

While he enjoys analyzing numbers, he finds this process time consuming and wishes there were easier ways to track stock performance over time. He doesn't want to go off a gut feeling, he wants clear data and visual insights that help him make informed decisions. Whether he's investing for future security, early retirement, or simply wanting more money, he needs something that streamlines stock tracking, provides historical performance data and helps him make decisions efficiently.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	John wants to gain more profit from his savings, so he wants to diversify his investments and make good decisions
<b>Sees</b>	To make sure he has enough savings, with inflation going up he worries
<b>Feels</b>	John feels that he needs to have savings and the best way to do that is to invest
<b>Does</b>	John research different apps that would be of help

### **Problem Statement + Alternative w/ Value proposition**

<b>Problem scenario</b>	<b>Current alternative</b>	<b>Value proposition</b>
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John wants to gain more profit from his savings by diversifying his investments	He looks up company's stocks in his off hours, comparing them to each other in excel	John needs an app that lets him see the profit the stock makes in the last three months and the last years
John does not have much time to check his investments	John only checks every so often, so he could miss when a investment isn't worth it now	John needs an app that lets him check his investments quickly and alert him if something goes wrong
John works best with graphs, so he wants to see his investments in graph format	If he has time, he takes the investments and inputs them to excel to make a graph	The app needs a tool that allows John to see a graph of the investment data

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## Detailed Persona Richard J. Smith



**Problem statement:**

Richard J. Smith comes from a wealthy family and has been entrusted with a portion of his inheritance to invest. However, his parents are closely watching his financial decisions to determine if he is responsible enough to manage a larger share in the future. To prove himself, he needs to track gains and losses, assess risks, and ensure none of his investments are losing money.

### **Detailed Persona: Inheritance Fund – Richard J. Smith–**

Richard is a 21-year-old man born into a wealthy and influential family. While he has never had to struggle financially, his parents believe that wealth should be earned and maintained wisely and not wasted on reckless decisions. To test his financial discipline, they give him a very small portion of the family wealth to invest in and grow. If he proves himself capable, he will inherit an even larger sum for the future.

Richard main goal is to preserve the wealth and make it grow strategically. He is not looking to take unnecessary risks but instead wants to maintain a slow and steady increase in his capital. As it stands, he lacks the deep financial expertise of professional investors and needs a way to quickly assess which investments are profitable and which ones may be draining his funds. To stay in control of his finances, Richard would like something that provides clear profit and loss tracking, risk assessment tools, and real-time alerts on underperforming stocks. He is not a hands-on investor, so the app must allow him to set benchmarks and receive automated performance updates.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	Richard wants to make the best decisions possible so he can get that bigger inheritance
<b>Sees</b>	Richard sees that to have a good plan, there needs to be predictions
<b>Feels</b>	Richard feels that he has a good plan to get the bigger inheritance
<b>Does</b>	Richard looks and asks people what the best app is to help someone with investments

### **Problem Statement + Alternative w/ Value proposition**

<b>Problem scenario</b>	<b>Current alternative</b>	<b>Value proposition</b>
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Richard Smith needs to show that he would make good investments with his money	He is investing in what he thinks will make a profit	An app that would recommend safe long term and short-term investments
Richard wants to see how much each investment is making or losing	He must research what is going on in each stock	The app will show the data of the profit or loss he is making
He wants updates that he can understand with the profit of the last month and a prediction of the next month	Right now he has to try to track everything that is going on himself	He needs an app that will show the past profit and the predicted profit of the stock

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## Detailed Persona - Zeke



### **Problem statement:**

Zeke is a typical 9-to-5 worker who tends to make impulsive investment decisions based on trending news and online hype. When he saw the GameStop stock surge, he immediately

jumped on board, hoping to make quick profits. However, his investing approach is more reactive than strategic, often relying on platforms like r/WallStreetBets for financial advice rather than careful research. He needs a stock portfolio app that helps him track his investments, assess risks, and provide smarter insights so that he can make more informed decisions rather than chasing trends blindly.

### **Detailed Persona: The Impulsive Investor – Zeke –**

Zeke is a 29-year-old office worker who sees investing as a potential shortcut to financial success rather than a long-term strategy. While he works a steady 9-to-5 job, he dreams of making one big investment that will set him up for life. He follows the stock market not through financial reports but through memes, viral trends, and online communities like r/WallStreetBets. He has some knowledge of investing, but he often jumps the gun on stocks based on hype rather than careful analysis.

Zeke doesn't have a solid portfolio strategy. He tends to buy stocks when they're trending and panic sell when the hype dies down. He often regrets not having better tracking tools that show which investments are actually performing well versus those that are just noise. While he enjoys seeing the number get big when makes a quick buck, he knows he needs to be smarter about tracking his decisions and understanding when to hold or sell. To avoid repeating past mistakes, Zeke needs a stock portfolio app that provides real time updates, risk warnings, and smart analysis of his investments. Something that would ideally flag stocks with extreme volatility, compare his investments against stable market trends, and offer insights beyond just social media hype.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	Zeke thinks that investing should be exciting and rewarding, not slow and boring
<b>Sees</b>	Zeke sees constant discussions about stocks going viral on r/WallStreetBets, making him feel the pressure to act fast
<b>Feels</b>	Zeke feels frustrated when he loses money due to impulsive decisions
<b>Does</b>	Zeke buys stocks impulsively based on trending news or online hype

### **Problem Statement + Alternative w/ Value proposition**

Problem scenario	Current alternative	Value proposition
Zeke wants to make better decisions with his investments, so he does not lose any more money	Right now, he is buying stocks when they're trending and panic sell when the hype dies down	An app that tracks what is making a loss, and alerts that they need to trim that
Zeke wants to understand what he is doing with his investments	Zeke did not research anything before buying some investments so now he is trying to understand what he is doing	An app that will give him a smart analysis of his investments
Zeke sells stocks in a panic, often losing money	He acts emotionally when stocks drop, selling too soon	An app that provides historical insights and market comparisons, helping him decide when to hold or sell

## Detailed Persona Ben



### **Problem statement:**

Ben is a 62-year-old grandfather who is preparing for retirement and wants to use his investments to spend quality time with his four grandchildren. Over the years, he has built a modest investment portfolio, but now that he is transitioning into retirement, he wants to ensure his funds are well-managed and accessible. Instead of aggressively growing his investments, he is focused on stability and smart withdrawals so he can use his money for travel, family outings,

and memorable experiences with his grandkids. Ben needs a simple, easy-to-use stock portfolio app that helps him track his retirement investments, monitor performance, and safely withdraw funds when needed, ensuring he can enjoy life without financial stress.

### **Detailed Persona: Retired Family Man – Ben–**

Ben is a 65-year-old retiree who has worked hard all his life and is now ready to slow down and enjoy time with his family. He has four grandchildren whom he adores, and his biggest priority is making memories with them whether that's taking them on vacations, helping with their hobbies, or just treating them to fun activities. After decades of working, he now relies on his savings, pension, and stock investments to fund his retirement lifestyle.

Ben isn't a stock expert, but has accumulated investments over time, either through a 401(k), mutual funds, or individual stocks. However, now that he is no longer working, wants a clear and reliable way to manage his investments without unnecessary complexity. He is looking to maintain a steady increase in stock value, as he wants to avoid high risk trades. Since Ben wants to relax and enjoy his retirement, he needs a user-friendly stock portfolio app that allows him to check his investments quickly, track dividends and withdrawals, and receive alerts on market changes that might impact his retirement funds.

### **Thinks, Sees, Feels, Does**

<b>Thinks</b>	Ben thinks that managing his investments should be straightforward and stress-free. He's concerned about unintentionally making poor financial decisions and is looking for a tool that minimizes risks while ensuring his money grows effectively
<b>Sees</b>	Ben sees that many investment platforms are unnecessarily complicated, full of confusing terms, and made for experienced traders instead of retirees like him
<b>Feels</b>	Ben often feels overwhelmed by how complex investment tools can be. He's afraid of making a mistake that could hurt his financial security
<b>Does</b>	Ben searches online for user-friendly stock portfolio apps. He also turns to his friends for recommendations on stress-free options

### **Problem Statement + Alternative w/ Value proposition**

<b>Problem scenario</b>	<b>Current alternative</b>	<b>Value proposition</b>
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Ben needs to make sure that he does not use all the savings at once	He manually tracks withdrawals and tries to budget on his own, which is difficult and time-consuming	An app that allows him to keep track of his retirement savings and spending habits
Ben struggles to navigate the current platform he uses	The existing platform is too complex, with too many unnecessary features	An app that has an easy-to-use interface with clear instructions
Ben worries about market fluctuations affecting his retirement funds	He checks financial news occasionally, but often misses key market changes	An app that provides real-time alerts about market changes that might impact his investments, helping him make informed decisions

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## 5 Retrospective and Lessons Learned

I'll admit, we stumbled a bit at the beginning, but by the end, i think had a smooth workflow and delivered a solid app. Here's what stood out:

- **Choosing the Right Tool:** We briefly debated Flutter/Dart (two of us had prior experience) but ultimately went with React because it was the one framework everyone felt comfortable ramping up on quickly.
- **Component Ownership Saves the Day:** Early merge conflicts taught us to assign “owners” for each page or feature. Everyone had their own React component folder and CSS file, that modularity paid off big time.
- **Communication Is Everything:** We often found ourselves “waiting” on teammates before changing a file. A quick note (“I’m editing StockPage today”) or a shared status board would’ve made a bigger difference.
- **Balancing Acts:** Between classes, homework, and life, our progress sometimes stalled. Next time, tighter sprint commitments will keep us on track.
- **Adapt and Overcome:** Despite varying skill levels and a slow start, we adapted, learned on the fly, and wrapped up a functional app by the semester’s end. Teamwork truly made the difference.

## 6 Future Work & Roadmap

Looking ahead and back, we had plenty of ideas for extending and refining the app. For example, we could add push notifications for price alerts, advanced charting tools with moving averages, the ability to share custom watchlists on social platforms, offline-mode support for intermittent connectivity, internationalization with multi-currency displays, improved accessibility features such as keyboard navigation and screen-reader compatibility, user-defined alerts and watch lists, real-time streaming updates, and a more polished CSS theme with subtle animations. Of course, no product is ever perfect, only ever ready to ship. However, these enhancements could be revisited later, although, i think we have considered going our separate ways.