CSCI 5308
Group – 19
Project Proposal

MMS – Manage My Stock

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Overview

Stock trading involves buying and selling shares in companies to make money on daily changes in price. This project aims to simplify this process by offering a comprehensive view of the trading process. The purpose of a stock exchange is to facilitate the exchange of securities between buyers and sellers, thus providing a marketplace. The exchanges provide real-time trading information on the listed securities.

The Stock market application aims to emulate only the most important functionality found in popular stock-trading platforms such as Fidelity investments, tastyworks etc. The application also aims to report accurate data and perform necessary validations to mitigate any fraudulent transactions.

In this project, we aim to create a Web Application with most business logic written in JAVA. Additionally, the project also uses a relational database (MySQL) for storing data used for analysis purposes. The application is implemented in local development environments and is deployed to TEST and PROD environments. The project is implemented incrementally in sprints using agile practices like SCRUM and Principles of object-oriented programming such as SOLID principles, test-driven development, continuous integration/continuous deployment principles.

Roles

There are 2 major roles involved in the application: -

1.**User** – Users are customers of MMS – Manage My Stocks. A user can use the application to manage funds, create and modify a watchlist to track price movements of various stocks, check portfolio status, purchase stocks from the market, sell stocks from the portfolio and check historic price data for various stocks.

2.**Admin** – The admin is a user with special privileges to introduce new stocks (for example IPOs) to the market and modify current stock prices.

Use Case Diagram

Diagram below shows all functionalities for user and admin roles in the application.

f1.0 system usecase diagram

Modules

The project has the following modules: -

1. Authentication
2. Portfolio
3. Watchlist
4. Purchase Stocks
5. Sell Stocks
6. Funds
7. Margin
8. Historic Data

Authentication

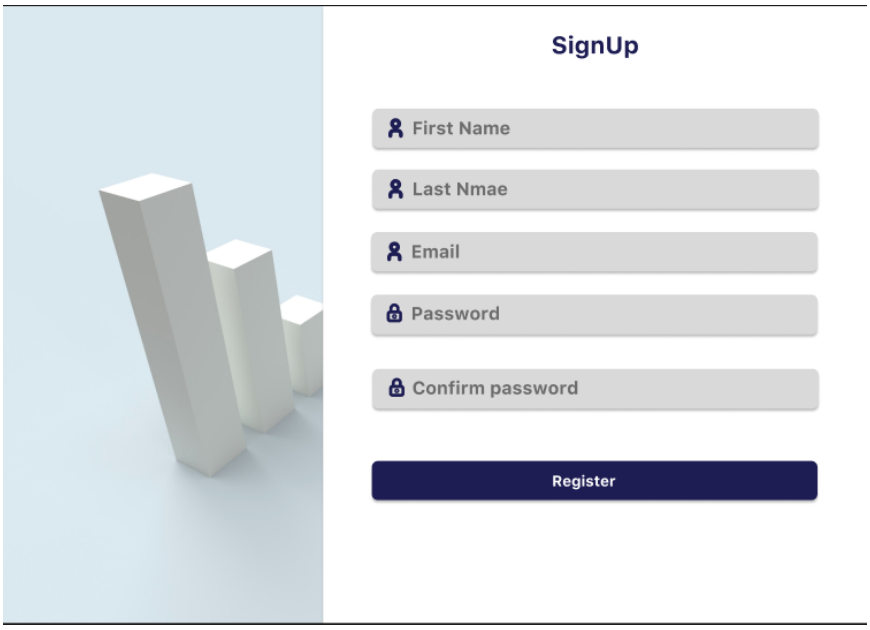
This module focuses on creating new user accounts, user login, admin login and resetting passwords.

Create new user – A new user will have to register into the application by providing a valid email-id, first name, last name, desired password and bank account details. On clicking the submit button, system will save the information into the database and redirect user to the login page.

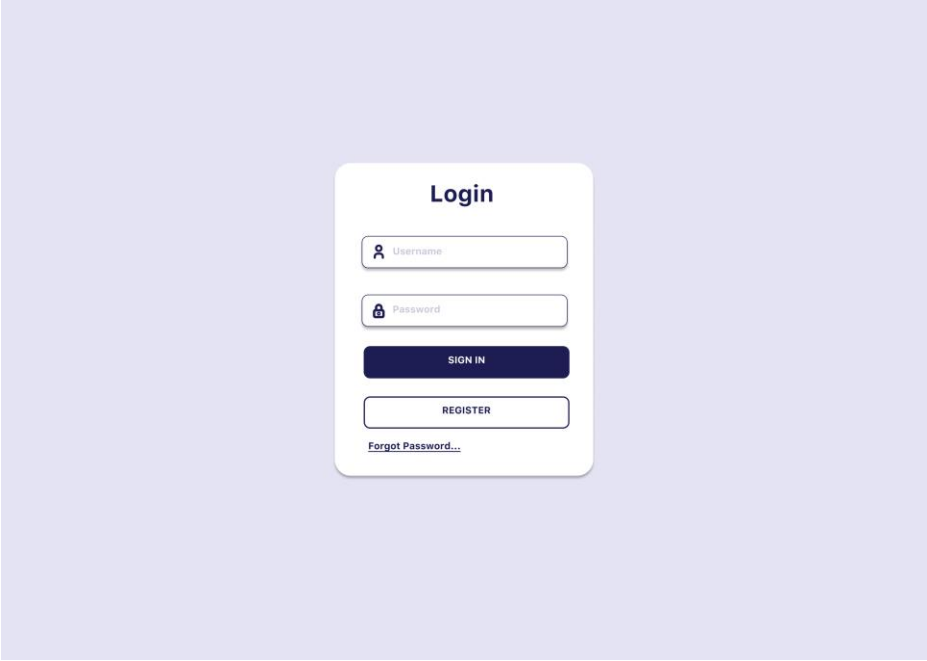
User Login – A user can login to the application by providing a username and password. System will validate the entered credentials with the database. If authentication is successful, user home page is displayed else Error – "Invalid Credentials" will be displayed on the screen.

Reset password – User can reset password by entering a valid email-id.

Admin Login – Admin can login to the application by entering admin username and password. System will validate the entered credentials with the database. If authentication is successful, admin home page is displayed else Error – "Invalid Credentials" will be displayed on the screen.



f 1.1 Authentication module signup page

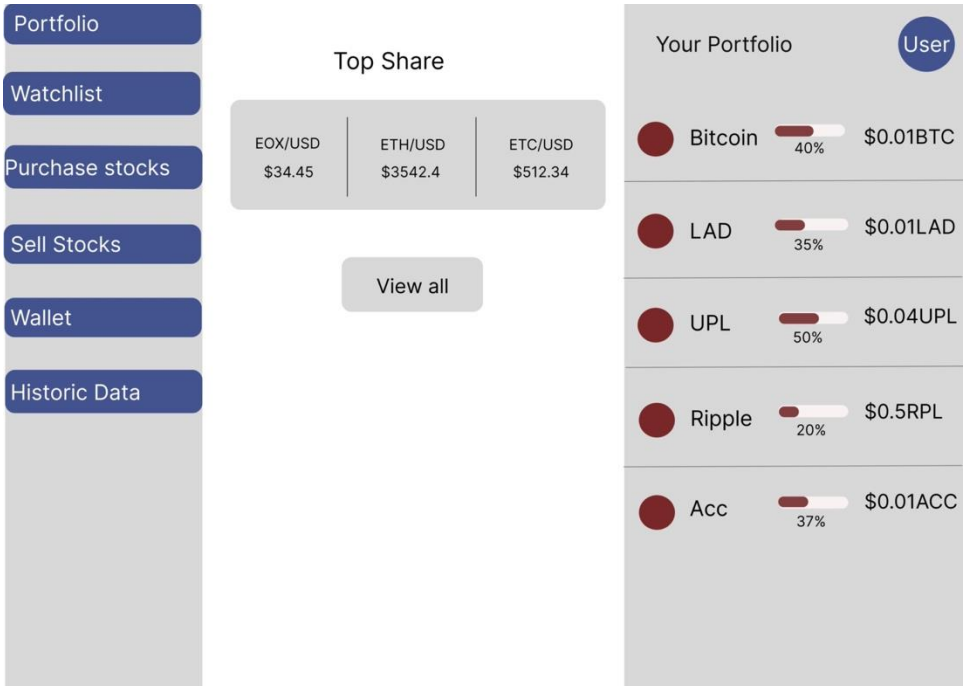


f 1.2 Authentication module login page

Portfolio

This module focuses on providing a birds-eye view of the user's portfolio which includes purchased stocks, quantity, purchase price, total invested amount and available funds.

View Portfolio – Users can view their portfolio on the user home page.



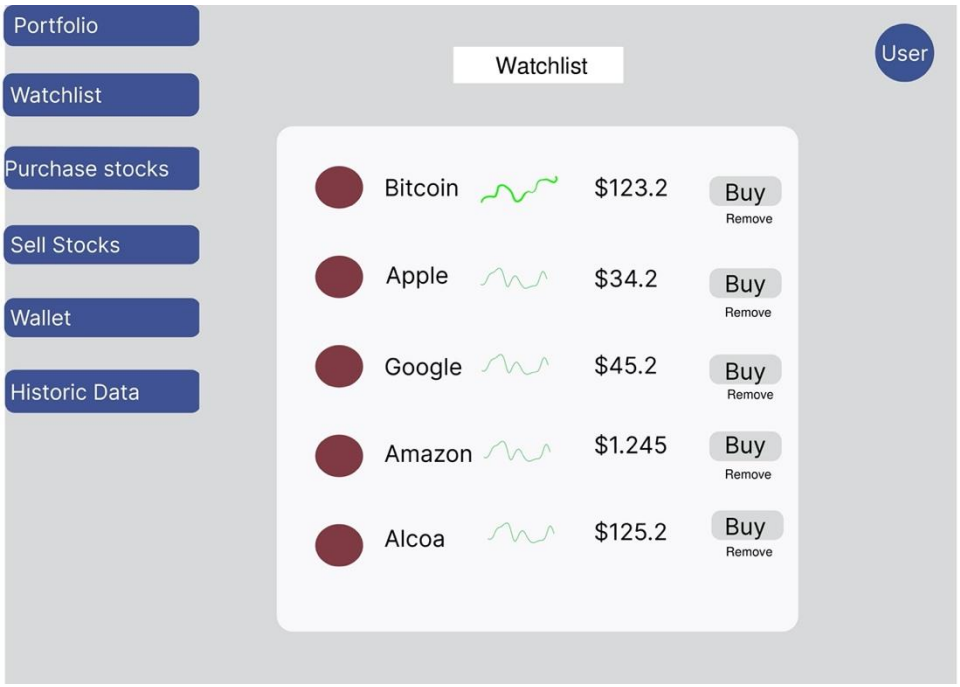
f 1.3 Portfolio module

Watchlist

Watchlist is a list of stocks with their current prices, being tracked by the user. This module focuses on functionalities that allow a user to modify the watchlist.

Add to watchlist – Users can add from a list of available stocks to the watchlist. When user enters a stock name, system will check the database to determine if its present in the list of available stocks. If present, user's watchlist will be updated in database else Error: "Stock not available" will be displayed.

Remove from watchlist – Users can remove stocks, which they no-longer intend to track, from their watchlist. System will remove the selected stock from the user's watchlist in the database.



f 1.4 user watchlist

Purchase Stocks

This module focuses on the functionality that allows users to buy stocks from the market.

Create a purchase request - Users must select a stock to purchase, enter the desired quantity and maximum offered price per share. System calls validate functionality to validate the purchase request. If validation is successful, system adds the stock to user's portfolio and deducts the amount from available funds.

Validate a purchase request -
After user inputs the data, system checks if the entered quantity is more than 0, maximum offered price is greater than or equal to the stock's current market price and if there is enough funds and margin amount to buy the desired quantity. If all checks pass, the validation is successful. If any one of the check fails, validation is unsuccessful.

Check	Status	Display
Entered quantity > 0	Fail	Error: "Purchase quantity cannot be less than or equal to 0"
Maximum offered price >= current price	Fail	Error: "Maximum offered price is below the current stock price"
Purchase amount >= funds + margin money	Fail	Error: "Funds not available"

f 1.5 Purchase Stock

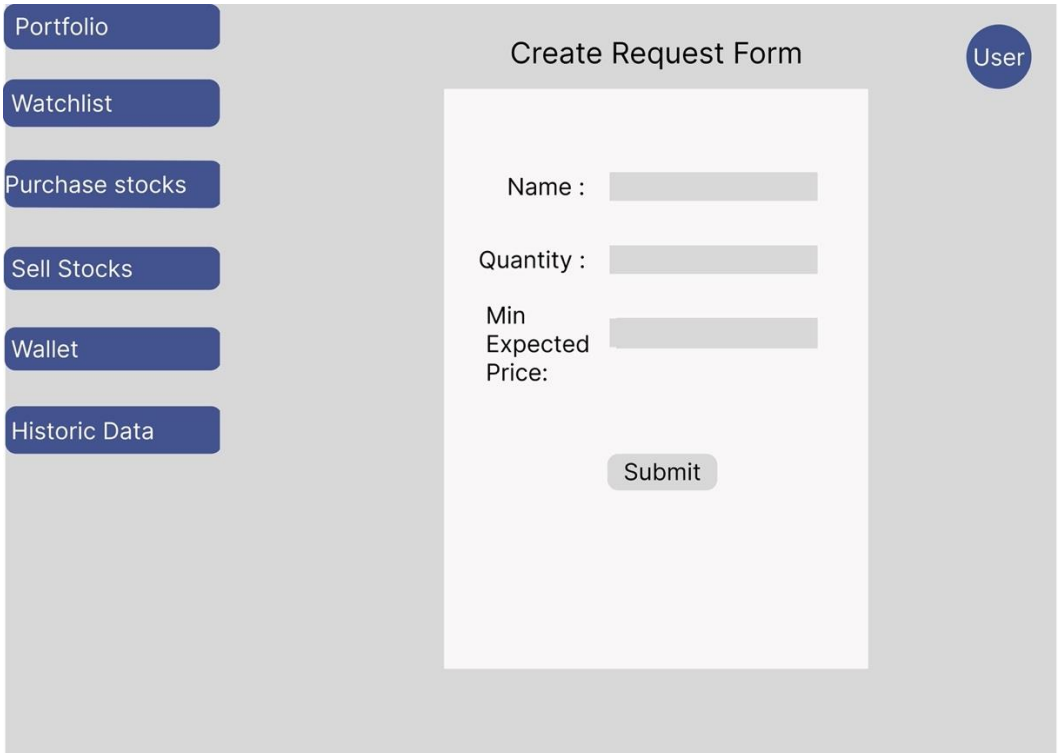
Sell Stocks

This module focuses on the functionality that allows users to sell stocks from their portfolio.

Create a sell request – Users must select a stock from their portfolio, quantity of shares to be sold and minimum expected price per share. System calls validate functionality to validate the sell request. If validation is successful system removes the stock from user's portfolio and adds the proceeds to the available funds.

Validate sell request - After user inputs data, system checks if the entered quantity is more than 0 but less than or equal to the quantity held by the user and minimum expected price is less than or equal to the stock's current market price. If all checks pass, the validation is successful. If any one of the check fails, validation fails.

Check	Status	Display
Entered quantity > 0	Fail	Error: "Sell quantity cannot be less than or equal to 0"
Entered quantity < Quantity held in portfolio	Fail	Error: "Specified quantity exceeds held quantity"
Minimum expected price <= current price	Fail	Error: "Minimum expected price is above the current stock price"
Purchase amount >= funds + margin money	Fail	Error: "Funds not available"



f 1.6 sell order request form

Funds

This module focuses on the functionalities that allow users to manage their funds.

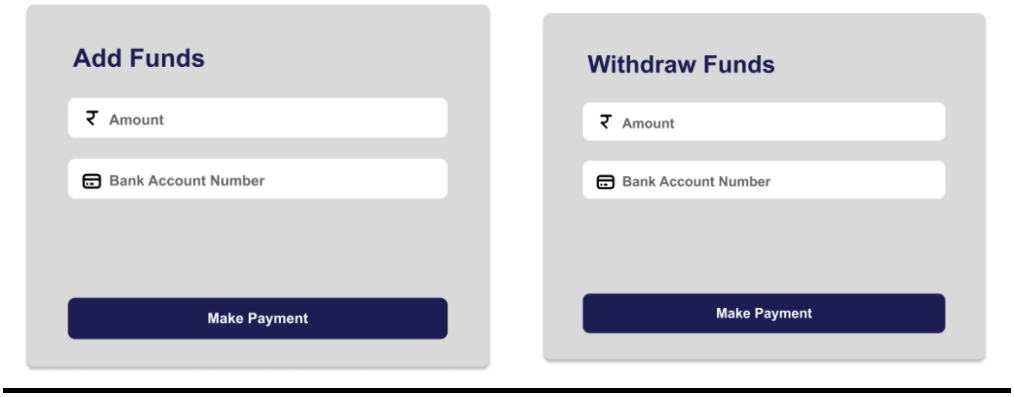
Add funds – Users can add funds using their card to the 'MMS' wallet. This functionality is envisioned to mimic a traditional payment gateway. Once user enters the card details, system calls validate functionality. If validation is successful, available fund is updated for the user in the database.

Validate add fuds request – The Validation for Credit/Debit Card Number is done through the number of digits. A 14-digit number qualifies as a VALID card number.

Withdraw funds request – Users can withdraw an amount from their 'MMS' wallet by specifying the amount to withdraw. System calls validate functionality to validate withdrawal. If successful, system updates user's available funds in the database.

Validate withdraw funds request – System validates if the entered amount is greater than 0 but less than or equal to the user's available funds. If all checks pass, validation is successful. If any one of the check fails, validation fails.

Check	Status	Display
Entered amount > 0	Fail	Error: "Amount must be greater than 0"
Entered amount <= Available funds	Fail	Error: "Amount exceeds the available funds"



f 1.7 Add and withdraw Funds

Margin Trading

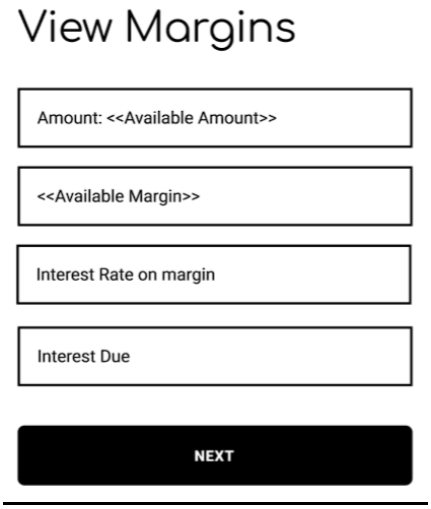
Margin is the collateral that the user must deposit with their broker or exchange to cover the credit risk the holder poses for the broker or the exchange. This provides additional leverage to the users while trading.
Users can borrow up to 50% of the value of equities in a margin account held at a stock brokerage and will pay interest charges for the privilege of doing so.

View available margin – Users can check the available margin amount which can be used to purchase stocks.

View used margin – Users can check the margin amount that has been used to purchase stocks.

View interest rate on margin – Users can check the interest rate on used margin amount.

View accumulated interest on margin – Users can check the interest accumulated over time on the used margin amount.



f 1.8 Margin Trading

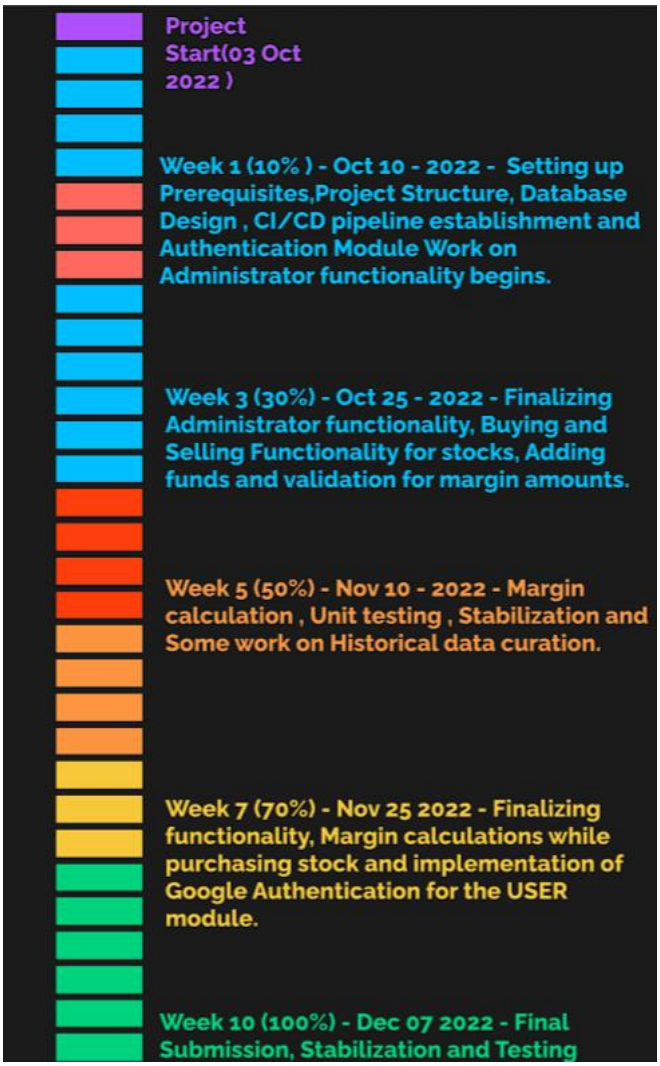
Historic Data

This module shows detailed information about past traded stocks with volumes by customer in a graph visualization.

f 1.9 user historic data

Project Plan

The project timeline would be divided into sprints each approximately 2 weeks long. At the end of each sprint, we will plan the next sprint.
Also, we will have a SCRUM daily and weekly meetings with the Tas to track our progress. Below is the tentative project schedule that we will follow:



f 1.10 project planning

Citation

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