Project 7
Colorado CSCI 5448 - OOAD

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Title: Net Banking Simulator

Final State of System Statement:

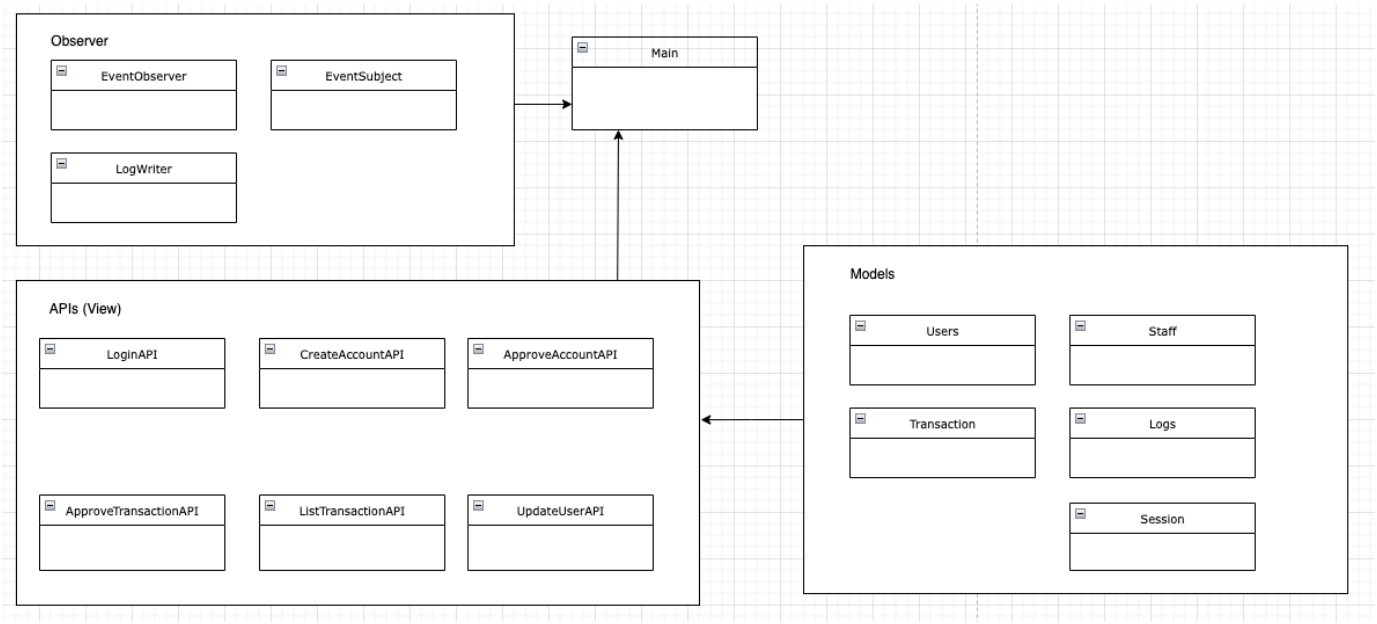
The main functionalities that we included in the project are:

- The user has the capability to perform a transaction and deposit an amount in their account. Also, be able to view their transaction history.
- Staff admin page to handle approve or reject requests based on transactions that are higher than a certain amount.
- Password encryption implementation

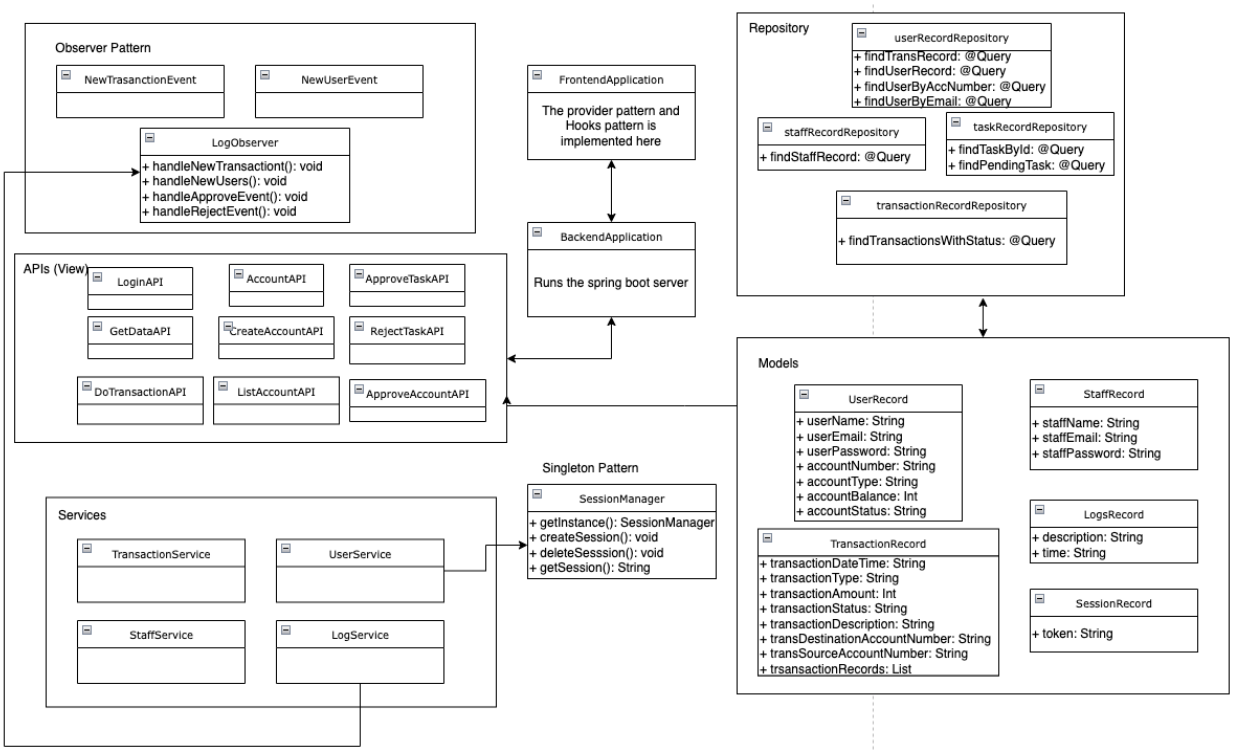
Here are some of the few stretch goals that we wanted to achieve in our project:

- Providing multiple card implementation for the user.
- Dual factor authentication which included having an extra level of security with OTP login.
- Enabling users to block and unblock account/card.

Project 5 UML Class Diagram:



Final UML Class Diagram:



The initial UML diagram had a basic overall structure present, whereas, in the final UML diagram, we have shown in depth what all classes are being used in the project with the patterns highlighted. We have made use of design patterns like the Provider pattern and React Hooks pattern in the frontend application. Also, we have shown the repository implementation diagram which handles the database query calls between frontend and backend.

Third-Party code vs. Original code Statement:

Most of the code is written by self. We had to refer to various resources for understanding the logic and implementation. Few of them were connection between MongoDB and SpringBoot, writing the collections and queries in the backend, token based authentication with Spring security and JWT, tailwind and material UI for frontend beautification in React. Some of the links we referred to are listed below.

- https://www.mongodb.com/compatibility/spring-boot
- https://spring.io/guides/gs/accessing-data-mongodb/
- https://www.bezkoder.com/spring-boot-jwt-authentication/
- https://tailwindui.com/

Key design process:

- Choosing the backend framework for the project took some time as we had to evaluate on the time constraint, difficulty level and experience we had about the framework. We went with Spring-Boot as it uses Java programming language and also, since we had implemented all the design patterns learnt in class using Java, we were able to achieve building the backend service and implement various design patterns.
- One of the issues we faced while building backend service was the connection establishment with MongoDB and trying to debug making api calls. We had to learn the pipeline involved in implementing the connection with Spring-Boot and creating all the collections and queries required.
- As our graduate research topic was about design patterns in React, we wanted to implement few of them in the front end as well. Usually design patterns are not much explored in the frontend and developers mainly look into beautifying it with basic logic implementation. We took some effort to understand the design patterns present in React and used into our project. This leveraged us in creating unique, robust and scalable UI application.