Project Report

Database Systems

Semester Project

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Section BCS-5A

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HyderX Stock Exchange

Introduction:

The project aims to develop a stock exchange web application using Flask and SQLite. This platform allows users to simulate stock trading, and view their portfolios. The goal is to create a functional and user-friendly interface to enhance understanding of stock market operations.

Background:

Research:

The stock market plays a crucial role in the economy by facilitating the buying and selling of company stocks. This project is inspired by the need to provide a simplified environment for individuals to practice trading without real financial risks.

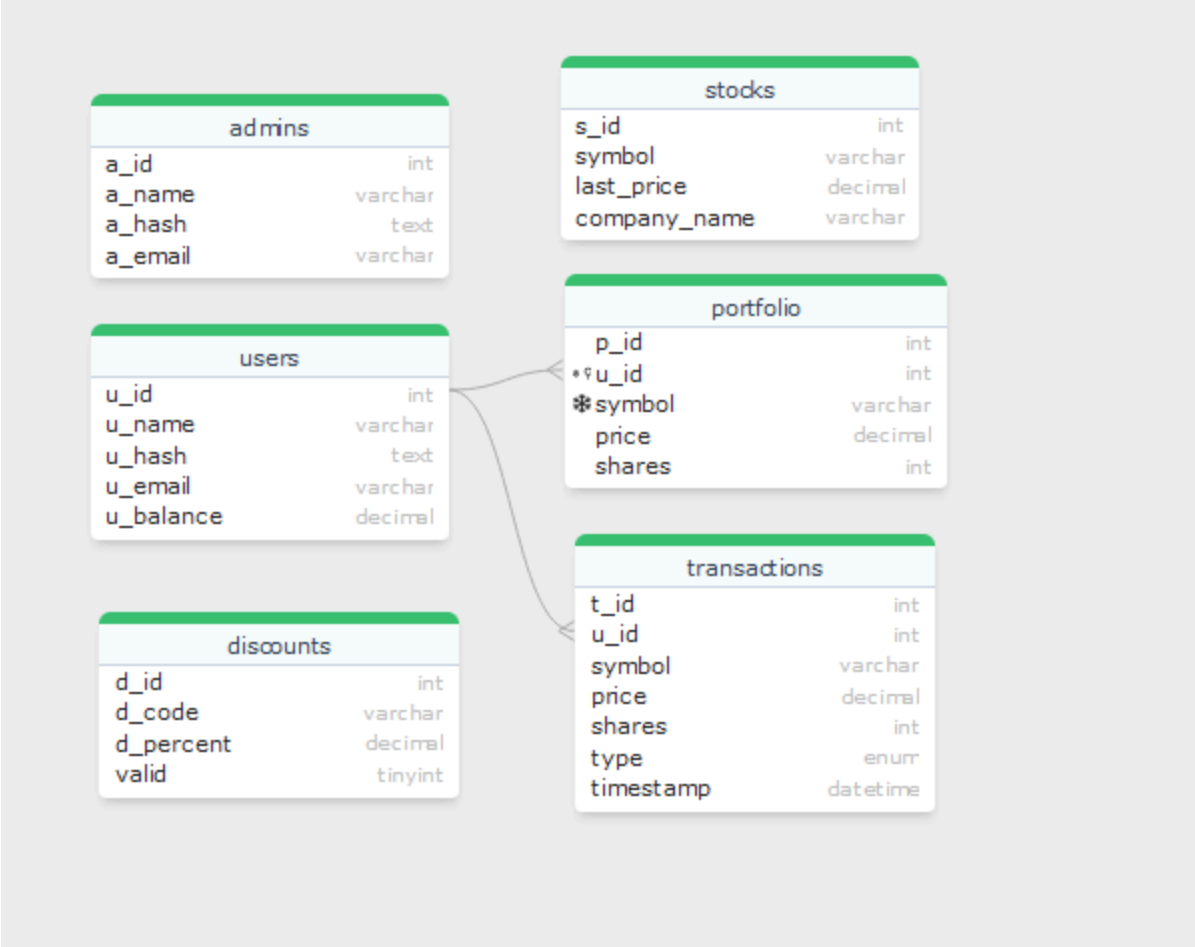
Project Selection:

Flask, a lightweight web framework, and SQLite, a robust database engine, were chosen for their ease of use, flexibility, and compatibility with Python.

Project Specification

The project includes the following functionalities:

1. User authentication (registration, login, logout).
2. Buying and selling stocks.
3. User management by admin.
4. Transaction history tracking.
5. Discounts
6. Real-time stock data retrieval using Yahoo Finance API(provided by finance.cs50.io).



Problem Analysis

Key challenges include:

- Ensuring secure user authentication.
- Handling real-time data fetching and updating.
- Error handling for user inputs

Solution Design

Project Details, Functionality, and Features:

- User Authentication: Secure login/logout, registration with hashed passwords.
- Stock Trading: Buy/sell operations with real-time price validation.
- Portfolio Management: Tracks user's stock holdings.
- Transaction History: Logs all buy/sell activities.

- Stock Quote: Provides current stock prices and company information.

Implementation & Testing Phase

The system was implemented using Python, Flask, and SQLite. The login, register and logout functionality was added first after which the index was completed to show the user portfolio. Buy and sell routes were then created and index was updated to reflect changes from buy and sell. After then history route was created. Quote was created for user to lookup specific tickers without buying.

Admins were directly added to db and a new route was created in app that can only be accessed directly from which the admins can login. Then admins can add or remove users and discount codes.

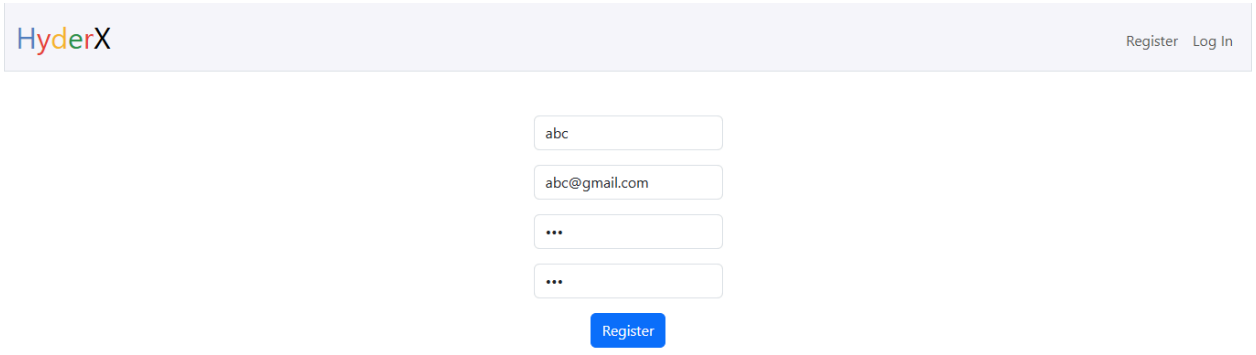
Testing involved creating multiple users with same or different username to see if error handling worked. Each field was completed using correct and incorrect values to check error handling in all app routes.

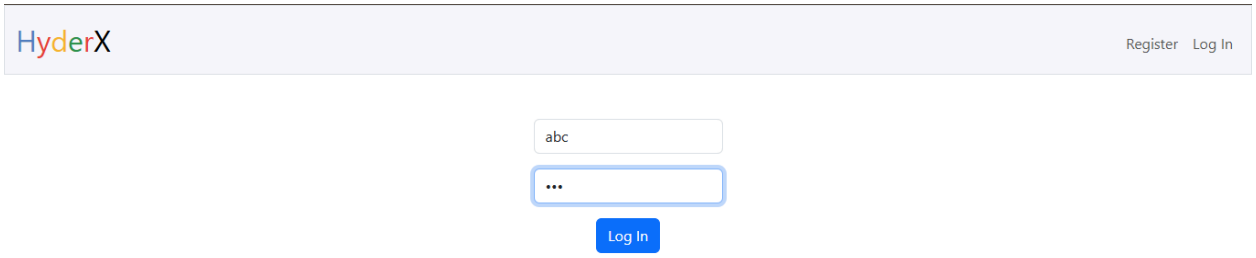
Results

Outputs:

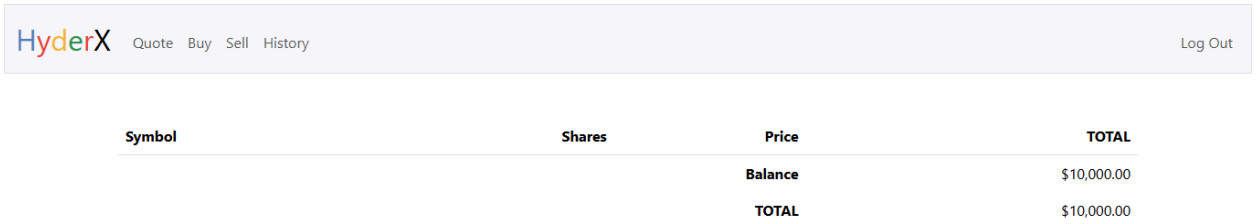
Screenshots of key functionalities, including:

1. User Registration and Login Page.

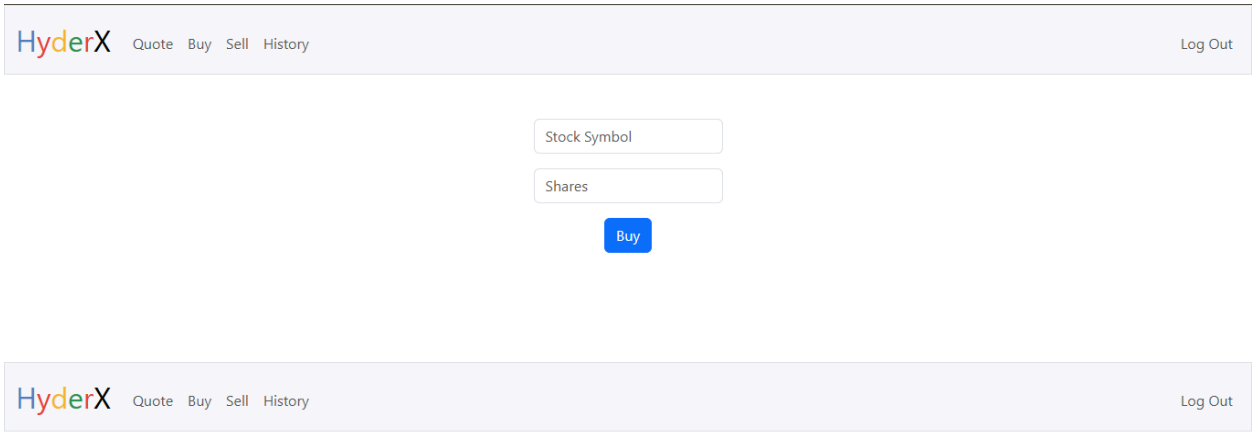


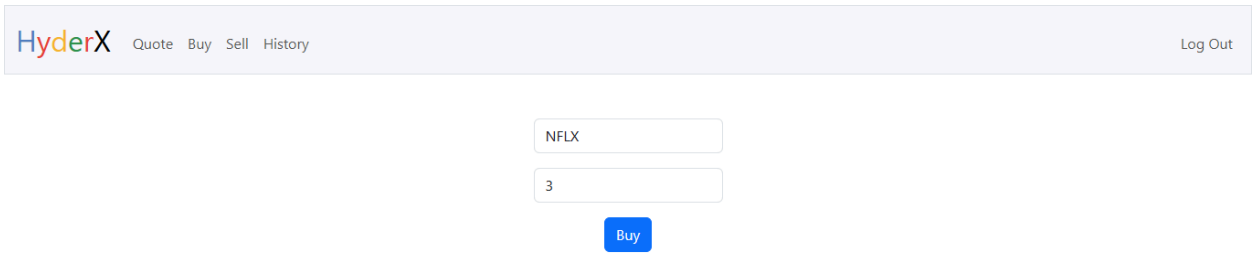


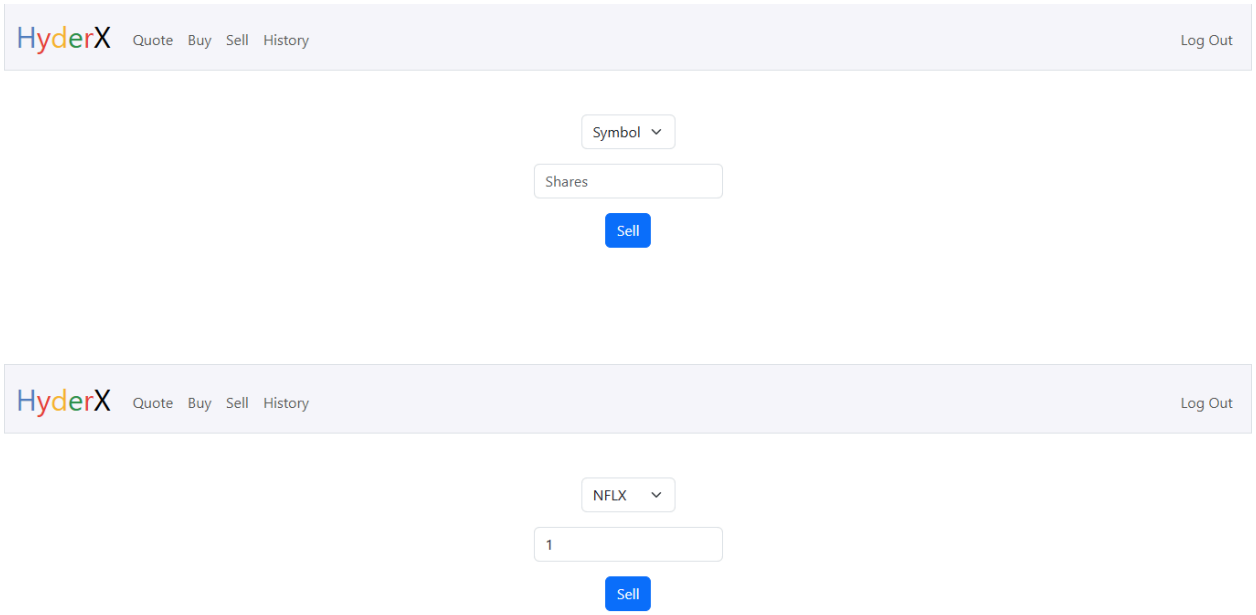
2. Portfolio Dashboard.



3. Buy/Sell Stock Forms.







Conclusion (Summary & Discussion)

This project demonstrates the capabilities of Flask and SQLite in developing a functional stock exchange simulation platform. The user-friendly interface, coupled with real-time data, offers a practical tool for learning stock market trading. Future enhancements could include implementing machine learning for stock prediction and expanding to other financial instruments.