OrangeSofa Trading Simulator System

Database Application Project Report

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PART 1. README

Step 1

1. Download the provided zip file in your computer.
2. Unzip the file. It should contain a jar file (OrangeSofaTradeSimulator.jar), sql dump file (OrangeSofaTradeSimulatorDBDump.sql) and the application source code (src).

Step 2 - Import the database

1. Open MySQL Workbench
2. Navigate to Server -> Data Import
3. In import options, select “Import from Self-contained file”, choose the file path where you saved the provided dump file OrangeSofaTradeSimulatorDBDump.sql
4. Click on ‘Start Import’ button at the bottom
5. A new database named “orange_sofa_trade” should be created. Refresh the database to check.

Step 3 - Run jar file

1. Ensure JDK 11 version is installed.
2. If higher versions of JDK is installed, then please follow below steps (macOS) to switch to JDK 11
    01. Check current version: `java -version`
    02. Check version :`/usr/libexec/java_home -V`
    03. Switch to Java 11: `export JAVA_HOME=`/usr/libexec/java_home -v 11.0`
3. Open terminal at the folder where you have downloaded the provided jar file (OrangeSofaTradeSimulator.jar)
4. Run the command `java -jar OrangeSofaTradeSimulator.jar`
5. Follow the instructions in the terminal to login with mysql root username and password to connect to MySQL Workbench.
6. Follow the instructions prompted by the program.

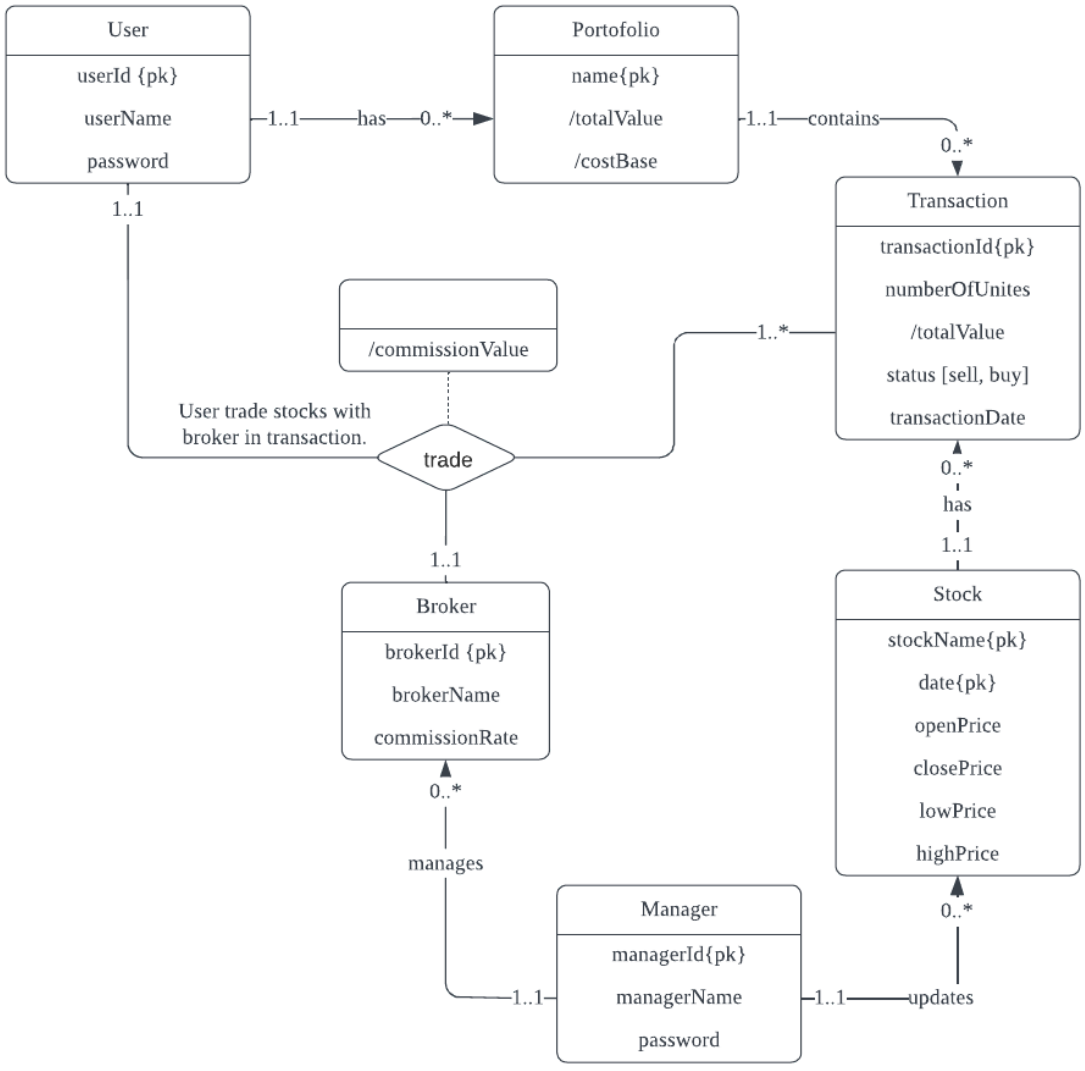
PART 2. TECHNICAL SPECIFICATIONS

1. Database: MySQL
2. Language: SQL, Java
3. Frontend: Java Swing & terminal

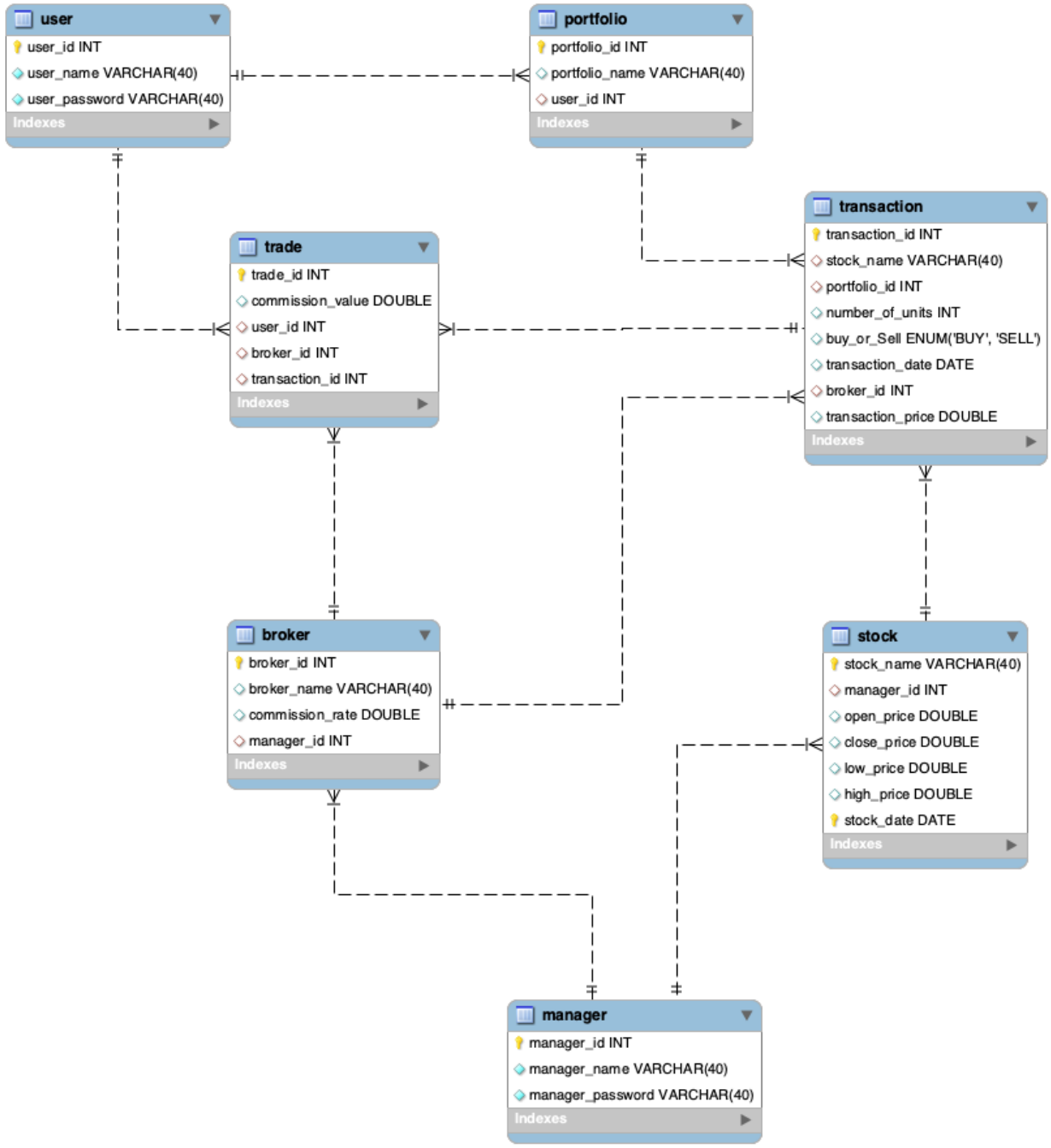
We used SQL and MySQL Workbench to create and maintain the database. Java was used to communicate with the user and interact with the database on their behalf.

We selected the Java mysql-connector-j-8.0.31 library for interacting with SQL. Users of the interface will use the terminal as well as GUI to communicate with the database and issue commands. Java will be used to interpret the terminal and GUI input, and then the generated commands will be sent to the SQL database.

PART 3. CONCEPTUAL DESIGN



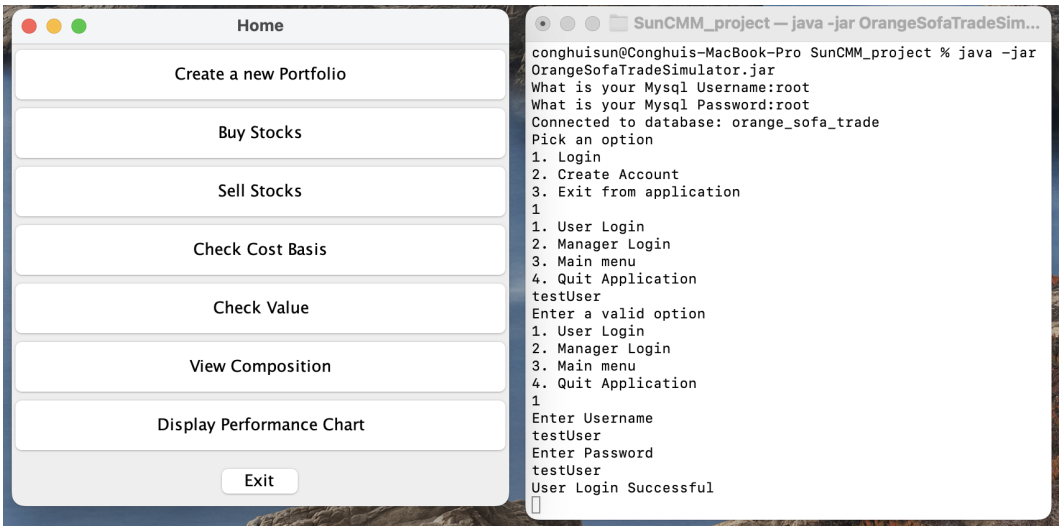
PART 4. LOGICAL DESIGN



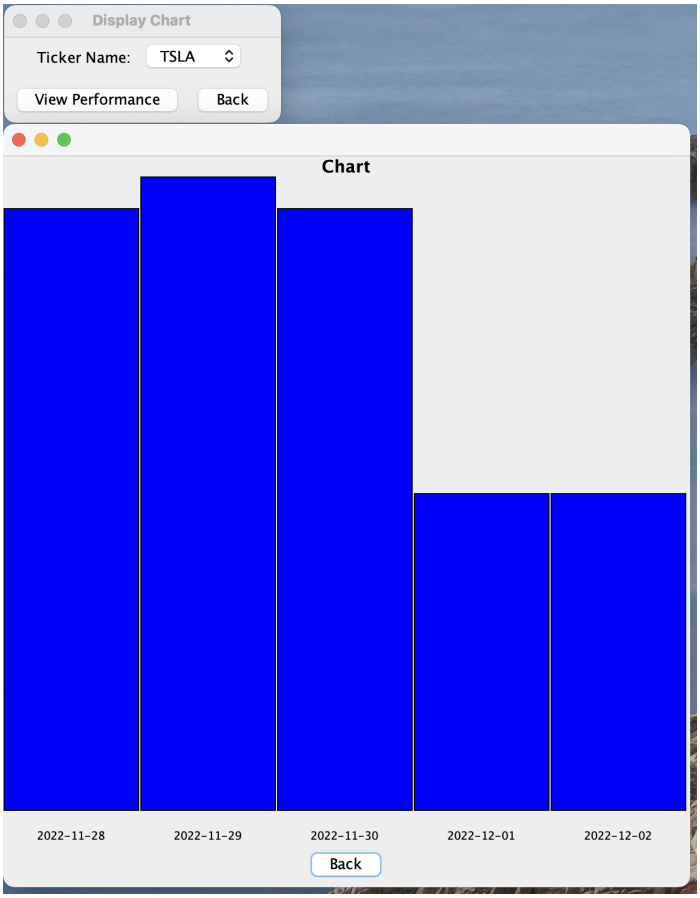
PART 5. USER FLOW

1. Main menu has three options
    a. Create account for user or manager
    b. Login as user or manager
    c. Exit application
2. Main menu option: Create account
    a. Create new manager
        i. Enter user name, password
            1. Username already exists: enter again
            2. Username not exists: successfully created
        ii. Back to main menu
        iii. Exit application
    b. Create new user
        i. Enter user name, password
            1. Username already exists: enter again
            2. Username not exists: successfully created
        ii. Back to main menu
        iii. Exit application
    c. Back to main menu
3. Main menu option: Login
    a. Login as a manager: Enter user id and password, if wrong id or password then back to login, otherwise lockin the manager system to operate on broker and stock.
        i. View broker: Get all the brokers' information including broker id, broker name, and commission fee of each broker.
        ii. Delete broker: Enter broker id, if broker id exists then delete sucessully, otherwise back to login.
        iii. Insert stock data:
            1. Select stock name from given stock list, if enter wrong name, then manager need to select again.
            2. Type in data information including stock data, open price, close price, highest price, lowest price.
        iv. Update stock data:
            1. Select stock name from given stock list, if enter wrong name, then manager need to select again.
            2. Type in data information including stock data, open price, close price, highest price, lowest price.
        v. Logout: logout manager account, back to main menu.
    b. Login as a user

Enter user id and password, if wrong id or password then back to login, otherwise login the user system to simulate stock trading. As a trade simulator, users are allowed to buy stock at any date to practice investment strategy.



i. View composition: check all portfolios and corresponding transactions.
ii. Add portfolio: enter new portfolio name
iii. Buy stock: Pick a portfolio, then pick the stock, the date to buy this stock, the number of units to buy and the broker who will charge the commission fee of this transaction.
iv. Sell stock: Pick a portfolio, then pick the stock, the date to sell this stock, the number of units to sell and the broker who will charge the commission fee of this transaction.
v. Check cost base: Pick a portfolio, check the total commission fee paid for all transactions in this portfolio.
vi. Check value: Pick a portfolio, check the total value of this portfolio by calculating total money of transaction with status buy minus total money of transaction with status sell.
vii. Display performance: Pick a stock, display the price chart to visualize the stock performance.



viii. Exit application

START
Exit
login
create account
user
manager
new user
back to main menu
new manager
enter user name, password
enter user name, password
enter user name, password
enter user name, password
valid
valid
valid
valid
No
No
No
No
Yes
Yes
Yes
Yes
user front end
select operation
Log out
Display Performance
View compostiion
Check value
Check cost base
Sell stock
Buy stock
Create a new portfolio
Insert stock data
Update stock data
Add new broker
Delete broker
View broker information
choose stock
choose portfolio
choose portfolio
enter name
Back home
choose ticker name
create portfolio
Back to home
choose number of units
choose broker
choose date of transaction
save
cancel
Pick a stock
Pick a stock
enter name, commition rate
Enter broker Id
valid stock
valid stock
add success
valid id
Enter date
Enter date
delete success
invalid id
valid date
valid date
enter details
enter details
valid data
valid data

PART 6. LESSONS LEARNED

1. Technical expertise gained
    a. Learned the technique to use mysql-connector-j-8.0.31 library for connecting the database and building the application using Java.
    b. Mastered the sql functions define, procedures, and CRUD operations.
    c. Learned to visualize data via charts.
2. Insights
    a. Time management: Settle down with one proposal as soon as possible to begin the rest of work. We changed our idea from building an e-commerce shopping application, to a snack database, finally to a stock trading project which wasted too much time.
    b. Data domain: stock data has
3. Realized approaches to the project
    a. Manager
        i. Create manager account
        ii. View broker information
        iii. Add new broker
        iv. Delete broker
    b. User
        i. Create user account
        ii. View portfolio, cost base, total value
        iii. Add new portfolio
        iv. Buy stock
        v. Sell stock
        vi. Display stock performance

Create account part and manager part used the terminal as front end, and all operations had error handling. The user part used Java GUI as front end.

PART 7. FUTURE WORK

- Connect real time stock data to add into the database.
- Upgrade the user part front end into a web page.