G03 - Final Project

CENG431 – Building Software Systems

In this project we are expected to use mentioned design patterns.

- Abstract Factory Creational Pattern
- Decorator Structural Pattern
- MVC Design Patterns
- Swing
- File I/O
- Three Layer Architecture

Project name is **FACoin**. This is a cryptocurrency exchange platform.

In this platform, an user :

- can login to the system
- can buy a coin with his/her money that in the bank wallet
- can sell a coin with his/her coins that in the crypto wallet
- view his/her bank wallet that includes his/her banknotes and their quantities like USD, TRY
- view his/her crypto wallet that includes his/her coins, their quantities and their current values
- view the graph of a trading pair like BTC/USD that includes day and hour candles
- see all coins of the platform with their current values (value change) and their percentage change
- sort them by their increase/decrease of percentage change
- take a trading pair like AVAX/TRY into favorites and delete from favorites
- see his orders and cancel his orders (orders must automatically executed if the order value is reached)

Coin values must be updated every 10 seconds. So you should request the coin values from an api. And every 10 seconds user must see updated values. Also transactions must be executed automatically with updated values.

In the homepage user can see the all coins, their current values and their percentage of changes. In that screen user must sort the coins according to their percentage of changes in the ascending or descending order. And user can see his/her favorite coins in that screen.

In the coin info screen user can see the graphics of selected coin with last 30 day candles or last 30 hour candles. In this screen there must be also favorites button to favor/unfavor the coin. And also this screen must include buy/sell process. User must give the coin quantity and coin value to buy/sell. If user can buy or sell a coin, a transaction (order) will be created and should be queued. Until transaction is executed it must be pending. Execution comes true like that. If the buy value of BTC/USD is given as 35000, it must be pended until BTC/USD becomes 35000.

In the buy process, the banknote in the user bank wallet ,whose value is the coin quantity * coin value, must be blocked until transaction is executed or transaction is canceled. In the sell process, the coin with the given quantity must be blocked in user's crypto wallet until transaction is executed or transaction is canceled.

In the wallet screen user can see his/her bank wallet that includes banknotes with quantites. And user can see his/her crypto wallet that includes coins that user has. For every coin in the wallet, user can see coin's quantity and current value of coin * quantity.

In the order screen user must see his/her approved and pending transactions. And user can also cancel his/her pending transaction.

On this platform, the banknotes and coins of the platform are stored in the JSON files with an id and name. Users' bank wallets and crypto wallets are stored in the JSON files with the wallet id and quantity and id information of currencies. For example :

```
"16240": {"coins": [
      {
         "quantity": "30.0",
         "id": "4"
      },
      {
         "quantity": "1.0",
         "id": "2"
      },
      {
         "quantity": "606.0",
         "id": "1"
      }
   ]},
```

16240 : Crypto Wallet ID that belongs to a user. Id values are the id's of coins and quantity values are the quantities of coins that user has. For example
id:4 is the AVAX coin - quantity : 30 is the quantity of AVAX coin that user has.

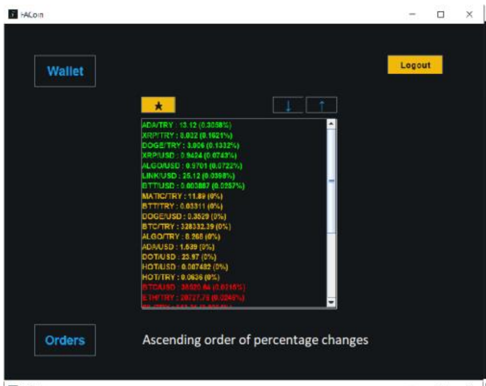
Transactions (orders) are stored in the JSON file with the transaction id, coin value of order, coin quantity of order, transaction type, pair.

```
"85171": {
      "coinValue": "35000.0",
      "coinQ": "1.0",
      "type": "Approved",
      "pair": "1-1"
   },
```

- 85171 : Transaction ID
- pair 1-1 means that coinID-banknoteID : For example BTC/USD (BTC ID 1 – USD ID 1)
- type : approved/pending = Approved transaction was executed and closed. Pending transaction is pending to execute.
- coinQ : quantity of the coin. User wants to buy 1 BTC. If quantity is negative, user wants to sell his coin. For example coinQ : -1.0 means user wants to sell 1 BTC.
- coinValue : 35000.0 = User wants to buy/sell the coin if coin reaches that value.

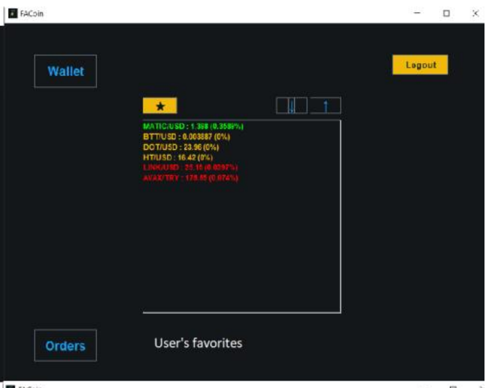
User information is stored in a XML file with user id, user name, user password, user’s crypto wallet’s id, user’s bank wallet’s id, user’s favorite coins’ ids, user’s transactions’ ids.
When a user performs favorite/unfavorite to a coin, buy/sell a coin (creating transaction) files should be updated. For example buy/sell process creates transaction. So user’s transactions must be updated. transactions.json file must be updated. Quantities in the user’s bank wallet and crypto wallet must be updated.

You should create JSON files which consists of at least 15 coin and at least 2 banknotes that include id and name. You should create an XML file which consists of at least 5 users with filled user id, user name, user password, bank wallet id and crypto wallet id. You should create two JSON files which contains users' bank wallets and users' crypto wallets. These wallets must have an id. Both the JSON and the XML files should be loaded first when the program starts.



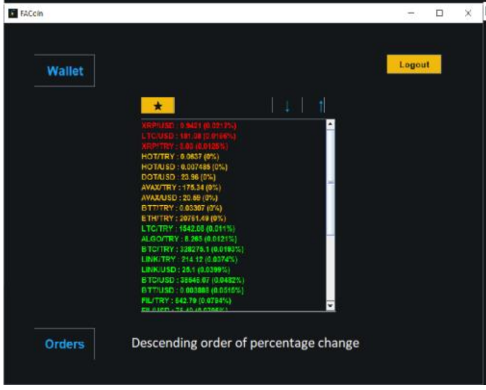
```
ADA/TRY : 13.12 (0.3058%)
XRP/TRY : 8.032 (0.1621%)
DOGE/TRY : 3.006 (0.1332%)
XRP/USD : 0.9424 (0.0743%)
ALGO/USD : 0.9701 (0.0722%)
LINK/USD : 25.12 (0.0398%)
BTT/USD : 0.003887 (0.0257%)
MATIC/TRY : 11.89 (0%)
BTT/TRY : 0.03311 (0%)
DOGE/USD : 0.3529 (0%)
BTC/TRY : 328332.39 (0%)
ALGO/TRY : 8.268 (0%)
ADA/USD : 1.639 (0%)
DOT/USD : 23.97 (0%)
HOT/USD : 0.007482 (0%)
HOT/TRY : 0.0636 (0%)
BTC/USD : 36020.44 (0.0216%)
ETH/TRY : 20727.75 (0.0246%)
```

Ascending order of percentage changes



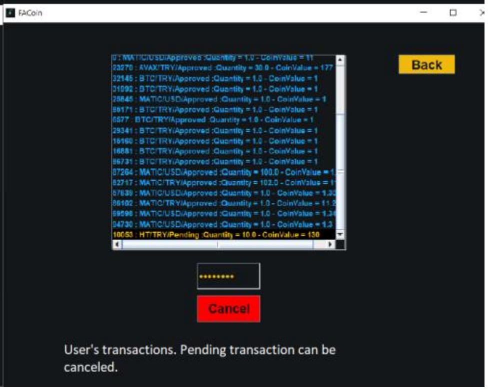
```
MATIC/USD : 1.398 (0.3588%)
BTT/USD : 0.003887 (0%)
DOT/USD : 23.96 (0%)
HT/USD : 16.42 (0%)
LINK/USD : 25.15 (0.0397%)
AVAX/TRY : 178.85 (0.074%)
```

User's favorites



```
XRP/USD : 0.9421 (0.0217%)
LTC/USD : 181.08 (0.0166%)
XRP/TRY : 8.03 (0.0125%)
HOT/TRY : 0.0637 (0%)
HOT/USD : 0.007485 (0%)
DOT/USD : 23.96 (0%)
AVAX/TRY : 175.34 (0%)
AVAX/USD : 20.69 (0%)
BTT/TRY : 0.03307 (0%)
ETH/TRY : 20751.49 (0%)
LTC/TRY : 1542.08 (0.011%)
ALGO/TRY : 8.265 (0.0121%)
BTC/TRY : 328275.1 (0.0193%)
LINK/TRY : 214.12 (0.0374%)
LINK/USD : 25.1 (0.0399%)
BTC/USD : 35646.07 (0.0482%)
BTT/USD : 0.003888 (0.0515%)
FIL/TRY : 642.79 (0.0784%)
```

Descending order of percentage change



```
0 : MATIC/USD/Approved :Quantity = 1.0 - CoinValue = 11
23270 : AVAX/TRY/Approved :Quantity = 30.0 - CoinValue = 177
32145 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
31992 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
25645 : MATIC/USD/Approved :Quantity = 1.0 - CoinValue = 1
89171 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
6577 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
29341 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
16160 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
16881 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
96731 : BTC/TRY/Approved :Quantity = 1.0 - CoinValue = 1
87264 : MATIC/USD/Approved :Quantity = 100.0 - CoinValue = 1
52717 : MATIC/TRY/Approved :Quantity = 102.0 - CoinValue = 1
57639 : MATIC/USD/Approved :Quantity = 1.0 - CoinValue = 1.3
86102 : MATIC/TRY/Approved :Quantity = 1.0 - CoinValue = 11.
69596 : MATIC/USD/Approved :Quantity = 1.0 - CoinValue = 1.3
04730 : MATIC/USD/Approved :Quantity = 1.0 - CoinValue = 1.3
10053 : HT/TRY/Pending :Quantity = 10.0 - CoinValue = 130
```

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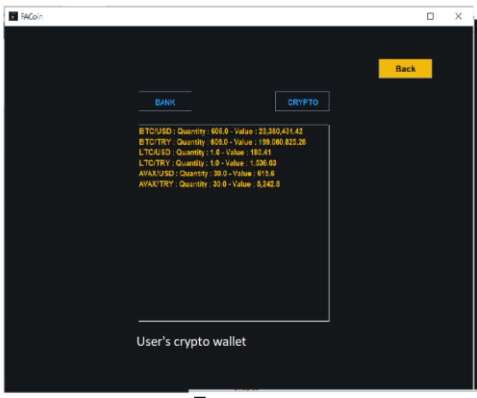
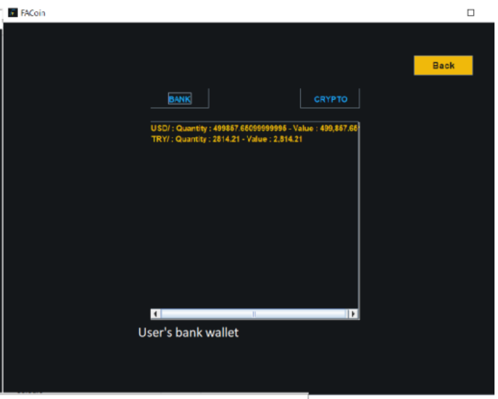
User's transactions. Pending transaction can be canceled.



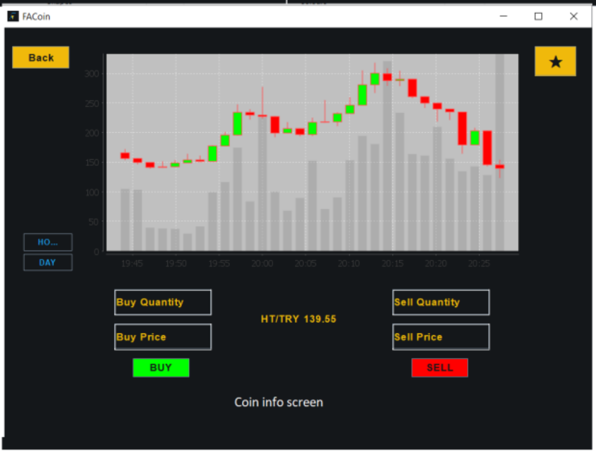
```
BTC/USD : Quantity : 606.0 - Value : 23,380,431.42
BTC/TRY : Quantity : 606.0 - Value : 199,060,825.26
LTC/USD : Quantity : 1.0 - Value : 180.41
LTC/TRY : Quantity : 1.0 - Value : 1,536.03
AVAX/USD : Quantity : 30.0 - Value : 615.6
AVAX/TRY : Quantity : 30.0 - Value : 5,242.8
```

User's crypto wallet



```
USD/ : Quantity : 499867.66099999996 - Value : 499,867.66
TRY/ : Quantity : 2814.21 - Value : 2,814.21
```

User's bank wallet



HT/TRY 139.55

Coin info screen