**Description of Final Project**

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This Account Management System have a base class Account and two derived class, BankAccount and StockAccount. The BankAccount can deposit and withdraw the money and print the transaction history, The StockAccount can store the current portfolios, buy or sell the shares and some more functions.

There is a design pattern: TEMPLATE. The two derived class are initiated with the base class Account (which is the skeleton of the classes) and use virtual function PrintHistory() to achieve the different functions. Two derived class share the cash balance and the cash balance is created by the file “cashbalance.txt”(if this file didn’t exist,).

In BankAccount, the user can choose to print the balance using GetBalance(). He can also use Deposit() and Withdraw() to change the value of the cash balance. While using Deposit() and Withdraw(), the change of cash balance will be recorded into “bank\_transaction\_history.txt”. The user can use PrintHistory() to print the transaction history of bank. The “bank\_transaction\_history.txt” will be printed in order.

In StockAccount, the constructor will create a doubly-linked-list to store the numbers and symbols of the portfolios using the file “portfolio.txt”. Also, the cash balance is loaded.

The destructor deletes all nodes in the list. The user can use function FindPrice() to find a specific price using the symbol name. Buy() and Sell() can let the user buy and sell the shares in their portfolio account. Every time they buy or sell, several files will be updated: 1) “stock\_transaction\_history.txt” will be updated to record the history of buys and sells. 2)”portfolio.txt” will be updated to record the current portfolios in your account including their symbol names and numbers of shares. 3)”cashbalance.txt” will be updated to record the newest cash balance in your account after buy or sell. 4)”bank\_transaction\_history.txt” will be updated to record the changes of the bank account (the money will be deposited or withdrawn). 5) ”totalvalue.txt” will be updated to record the current total portfolio and the current time. This text file will be used to plot the graph in MATLAB, so I separate the value of time to let it be easier to read when it is needed in function ViewGraph(). Function PrintHistory() will be used to read the data in ”stock\_transaction\_history.txt” and print them. Function DisplayPortfolio() will print the current portfolio, including their names, numbers, prices per share and their total values. Function Sort() will call a specific sort function. I use STRATEGY design pattern here. The user can choose a way to sort a list, and the function Sort() will call either one. But Bubblesort() and InsertSort() is hidden to the user. The default sort strategy is bubble sort. Function ViewGraph() will read the data in “totalvalue.txt” and use two arrays to record them as time and value, and use MATLAB to plot the graph of the total value of portfolio over time.

The StockAccount is always sorted whenever you display the portfolio, buy or sell the shares.

In main\_RongZhang.cpp, there are three menus. When the program start, it will let the user to choose the options to do what they want.

This program will generate 5 text files. They are “stock\_transaction\_history.txt”,”portfolio.txt”,”cashbalance.txt”,”bank\_transaction\_history.txt”,”totalvalue.txt”.