NYU School of Continuing and Professional Studies
Course Title: Object Oriented Analysis and Design
Fall 2011

Homework #4:
For this homework, you will create an object-oriented design for an online stock trading system. In order to create the design, you will have to do the object-oriented analysis, based on the requirements.

Scenario:
Your company is going to launch a simple online stock trading system. Each stock transaction will consist of the following information:
Stock symbol (e.g. IBM, MSFT, ORCL)
Number of shares
Transaction type (Buy or Sell)
User name
Share price (for purchases and/or sales)

In order to create a transaction, users have an account. An account is automatically created when a user registers. At registration, a user is required to supply the following information:
First name
Last name
Social security number
Street Address
City
State
Zip
Email address
Payment method (credit card, cheque, money order)
Opening cash deposit

An account must be opened with at least $1000.00.

Each user must have an account. The financial information included in the account is as follows:
Number of shares held for each stock
Share price (latest, as of last transaction)
Available cash

Each user would access the system via login-in. Once successfully authenticated via their user id and password, they may check their account balances, add/remove cash, create stock transactions or check transaction history. Each cash deposit must be accompanied by a payment method.

Before a user makes a purchase transaction, enough cash must be available in their account to cover the cost of the transaction. Once the transaction has been made, the available balance in the account must be debited (reduced) or credited (increased) to reflect the proceeds of sale or the cost of purchase transactions. Once a transaction has been completed, a confirmation email is sent to the user at the email address specified above.

All user and account information must be maintained in a relational database.

In addition to the above, the system will have two user groups – Users and Operators. Operators are responsible for administering the system and are not allowed to have accounts or to have transactions. Operators are only authorized to obtain the following reports:
All users – all system users
Users – all registered users in the system
Accounts – all user accounts and balances
User activity – given a user id, a list of transactions in chronological order
User login history – a list of login activity (when the user accessed the system) in chronological order.

Assumptions:
All transactions are completed (settled) instantaneously.
There is an object which provides the latest share price for each stock
All cash deposits are "good" and immediate, i.e. no cheques returned for insufficient funds, etc.
Number of shares will always be a whole number, i.e. 0.5 shares will not be entered.

Homework Requirements
This is *not* an implementation exercise. However, this homework assumes you are all familiar with how web pages look, not how they are implemented. There is no requirement for any HTML or Java, web servers, application servers, etc. Likewise, issues such as detailed session management, security; etc. are to be ignored.

The object of the exercise is for you to do the analysis (based on the requirements) and create a design. As a result, you will have to make certain assumptions regarding the screen elements that would need to be present if you were actually going to implement this. Hint: define methods to be triggered by user selections. Assume that as a result of these methods, data is made available from the user interface to wherever it is required. Also, define methods that will present your user interface.

You may need to supplement the information in the requirements. Feel free to add information that will make your design more complete, without changing the requirements. Any such additions should be described.

You should submit the following:

1. Class diagrams.
2. Any assumptions you've made.