CO225:Software Construction (Project II: Group project)
Auction server

Objective: You will design a software system using the following concepts:

- Threads,
- Synchronization primitives,
- Sockets,
- Objects, classes, and
- Collections

while working in a group.

Description: for this project you will implement a *server* which can be used by *clients* to bid for items in a stock exchange. Specification for each component in of the software is given below.

Item:

- Each item has, among other things a *Symbol*, *Security Name*, and a *Price*. This data is given in a CSV file; Comma Separated Value, file; of cause the once the system starts to run the price of the item will vary and what is given in the CSV is the initial price. (see stocks.csv)
- Read the CSV file and store the information about the items in a *suitable data structure* (i.e. suitable collection). Before selecting the data structure read how the data items will be accessed.

Server side: the server should be able to handle more than one connection at a time. It should display the current price of stocks via a GUI. You may assume that stock prices do not change in 500ms.

- Server will be listing to incoming connections on port 2000. It should be able to handle more than one connection at a time. Therefore should use threads for handling the connections.
- You should be able to connect to the server using a common communication tool such as *nc* or *telnet*.
- Once a client is connected the should except the first message to be the name of the client. For now we will not authenticate the client but use this as the name for all the bids. Once the name is given the client is expected to provide the *Symbol* of the security he/she is willing to bid on. If the provided *Symbol* is found the server should reply back with the current cost of the security or -1 to indicate that the *Symbol* is invalid.

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- Once that is done the clients are not allowed to change neither their names (obviously) nor the security that they are bidding on.
- Server should be able to locate a given stock item, update its price. Furthermore it should be able to track all the changes done to the stock item; how the offers varied with time and who made the offers.
- Server should be able to list the stock items (Symbol, name) together with the current price in an GUI. The GUI should display the price of following Symbols: FB, VRTU, MSFT, GOOGL, YHOO, XLNX, TSLA and TXN.
- For the display, you may assume that updates do not happen in 500ms.

Getting started: this involves a fair bit of coding. So first consider each of the operations needed and how that can be implemented before you start coding. You should be able to re-use most of the code from the lectures/labs. Divide the workload among the team mates.

Submission: Submit your code; all the code including the GUI and any glue code as a single zip/ tar file to Moodle before the deadline. You should also add a README file which would explain how to use the application. We will test your system on a Linux machine using *nc* as client.

Deadline 30th June 2020