Distributed Systems Assignment

Electronic Auction Design Document

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I declare that this work, which is submitted as part of my coursework, is entirely my own, except where clearly and explicitly stated.

# Electronic Auction Architecture

To create a system which allows for many clients to connect to a server I decided to make a design which would house the main server as a first point of contact before a thread was made unique to each client so not to bog down the main process with so many requests. The main server also instantiated one object of the application, which was ran via events from the clients or, from the auction controller which would manipulate the results based on the timer which will count down from a specific time period specified by each auction item. This class in question is called the Auction Controller as it will control which item is put up for auction as well as notify the clients about all events that have happened during the auction.

The client has a thread that will constantly be looking for messages sent from the server, these messages would also be sent from a thread which is the controller mentioned above. The client class will be where the user interacts with the auction, each time they enter a value between 1 – 4 they will have the option to join the auction, see the current item up for auction, make a bid, and see the list of all items up for auction.

This is done by the client thread class which is a thread in the server that will interact with that client specifically itself. This class will then use the reference to the auction class which holds the logic for the auction to perform the task the user wants, such as printing the list of auction items. This is done by using a to string method which is given to every class as all classes inherit the object class. This prints out the contents of every object in the array list, which then also has a custom to string method which will print out the values in the auction object except for the bidding period as the user doesn’t need to know that.

The server has another thread running which allows the admin to add new items to the auction, this is done in a separate thread as otherwise it would prevent any other client from being accepted until the admin has selected a value, or never allow them to select a value as the server is always waiting for another client asking to connect to it.

# Instructions

When you run the two bat files, run the server first, then run the client second as the client won’t be able to connect until the server is waiting to receive any incoming connections.

Once the client starts running you will be asked to give a username sticking you in a loop which will only be broken once you give a username that is not already in use. After you give a username, you will be shown a menu of options, if you enter one you will enter the auction and will receive any notifications about it, such as how much time is left, when someone makes a bid and who got the item when the bidding period has elapsed, if any.

The second option number two will allow the user to make a bid, if the bid is greater than the current price that has been bid then they will become the current bidder of that item and will be linked to it, while also notifying anyone in the auction that someone just made a successful bid.

The third option by pressing the number 3 will make it return them to string of the array list will print out the entire list of items to be auctioned.

And pressing 4 will exit out of the auction and close the program.