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CS 214: Systems Programming, Spring 2016 Programming Assignment 4: Bank System

The Multithreaded bank system is a series of programs that allows the User client to connect to the bank server. It constantly sends and receives requests from client to server and server to client. The system itself has a delay sleep period between each action of any program to ensure refresh rate and connection is synonymous. The communication of the two programs require mutex which locks certain parts of the code so that no more than 1 user can access certain locations at a given time.

Parts of the requirements in the program include Multithreading, meaning that many clients can log into their interface over the same localhost at the same time to access their personal accounts on the bank server at one time. The mutex is there to protect multiple access to 'one' specific account, however there is no lock on creating their own individual unique ones. While functions progress, the bank server program holds everything together, when the bank server shuts down, all the clients shut down. On the contrary, when the client shuts their own interface down the bank server is unaffected.

BIG(O)

The Program we are working on only puts a limit to the amount of accounts at 20 (constant account variable). Since deletion was not asked of us, the program can only add accounts and the number count can only go higher until 20. Through a series of linked lists, we used in our projects previously (sorted-list.c, sorted-list.h) the efficiency rating is $O(N)$ for the amount of linear search of running every node until a match of a certain account name is given. If however the name happens to be first with all its information attached to subsequent nodes, the running time for best scenario is $O(1)$. For the client user interface, every single function call into bank server is $O(1)$ time, whereas the bank server that is actually physically trying to locate the specific instructions all need to run through 'finding the account' (to either debit credit or just print) therefore is run at $O(N)$ times.