

# Report System Programming

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## **Completeness**

1. Fully implemented command line parameter architecture. Client can select IP and port. Server arguments are IP.
2. Server authenticates all users on the Authenticate document.
3. Server loads and tokenises hangman correctly.
4. Server randomly selects a two-word phrase.
5. Server exits when ctrl-c is pressed. Implemented that the sockets is being closed as well, but had trouble when doing multithreading. Closing threads instead.
6. Server to updates leader boards, but I have an weird bug, so it will crash when opened. But the leader board did work before the bug(Which lays in the accept call for some reason).
7. Client menu is implemented fully.
8. Hangman works perfectly.
9. Client exits when told, and server thread also exits.
10. Server is multithreaded. But it does not work properly because I did not have time to fix all the race conditions that are happening. I secured one critical section with a mutex lock. So process synchronization is not fully implemented.

The critical section problem was happening when calling a function containing shared variables. I fixed this by adding a mutex lock, so that only one thread can access the data at the same time.

## **Leader board**

Leader board is implemented in code, but I have trouble getting it to show. Seems like it's a send/receive sync issue.

Each user is given a user id. And the program contains a array of structs which contains number of games played and number of games won, and username.

When a game is played this information is updated. When leaderboard is supposed to show the program will loop to all the user that have played and display their stats.

## **Instructions**

When launching the server you will have to add the port number. The server is now ready, if you want to close server press ctrl-c.

When launching client you will have to add ip:127.0.0.1 and the same port number as in server. You can now login with a user. The multithreading part has a few bugs. This means that sometimes the server will hang if you try to log on multiple users at the same time. In order to have multiple user play hangman you will have to log on with one user and then start the hangman game. Then you can start more clients. The option show leaderboard will make the thread crash.