CIS457-02 Anthony Boos Group Chat Docs

Repo link (public): https://github.com/anthonyboos559/CIS457-groupchat

Responsibilities:

All me :^)

Server Design:

Main function -

The main function setups up a TCP server then continuously listens on localhost:5000 for incoming connections. When one is received, the server creates a 'makefile' TextIO socket for the client and assigns it a unique int ID. This socket and ID is then stored in a dictionary of all connected clients. A new thread is made to listen for messages from that client.

Handle_Client function -

The handle_client function listens for incoming messages from the client whose socket and id it was passed. When a message is received, it calls send_message to propagate that message to all other clients. This also checks for when the client disconnects from the server and send a kill signal to the client's message monitoring thread.

Send_Message function -

The send_message function takes a str message and the id of the sender. It then loops through the connected clients dict and sends writes the message to the socket, skipping the original sender. A Lock is used when accessing the connected clients dicts to ensure thread saftey.

Client Design:

Main function -

The main function sets up the client connection and spawns a monitoring thread that waits for message from the server. It then setups up all the GUI elements and a series of closure functions for the buttons. The user is prompted for a name before the chat window appears. This main function uses the Tkinter window to periodically check a multi-thread Queue for new messages. It also handles sending messages to the server.

Monitor_Socket function -

The monitor_socket function is much like the servers handle_client function. It listens for incoming messages and pushes them to the Queue to be displayed on the client. It also handles cases where the server crashes or when the connection was closed by the main thread to terminate all threads.

Add_To_Queue function -

Helper function to simplify the message formatting since the main thread will use the same queue to display messages that the user of the client sends.

Get_Timestamp -

Another helper function, used to simplify getting the current time that a message is processed.