

Mandatory Assignment 1 - Chat system

It is allowed to be in a group of 2-4

This is one of the compulsory assignments you need to hand in, and pass, to qualify for 3rd semester exam.

Hand in date: 9th December 2019, latest at 12:00, on Fronter.

Hand in info: You must deliver a zip compressed file

Overview:

You should code a Chat system, with a chat client that can connect to a chat server.

You may need to use threads in client and/or in server. The client should at the start ask the user his/her chat-name(username) and then send a join message to the server.

The server should accept clients to join the chat system, using a protocol specified below. When a client joins, the server should maintain and update a list of all active clients. The server will need to save for each client the user name, IP address and Port number.

If a new user tries to join with the same name as an already active user, then an error message should be sent back to client. Client can try again with a new name.

An active client can send user text message to the server that will just send a copy to all active clients in the client list.

The Client must send a "heartbeat alive" message once every minute to the Server. The server should (maybe with a specialized thread) check the active list, and delete clients that stop sending heartbeat messages. Maybe the active list should include last heartbeat time.

The Client must send a Quit message when it is closing.

The solution will use TCP to communicate.

Protocol between Chat server and client:

List of allowed messages (and their meaning):

JOIN <<user_name>>, <<server_ip>>:<<server_port>> From client to server. The user name is given by the user. Username is max 12 chars long, only letters, digits, '-' and '_' allowed.
J_OK From server to client. Client is accepted.
J_ER <<err_code>>: <<err_msg>> From server to client. Client not accepted. Duplicate username, unknown command, bad command or any other errors.
DATA <<user_name>>: <<free text...>> From client to server. From server to all clients. First part of message indicates from which user it is, the colon(:) indicates where the user message begins. Max 250 user characters.
IMAV From client to server. Client sends this heartbeat alive every 1 minute.
QUIT From client to server. Client is closing down and leaving the group.
LIST <<name1 name2 name3 ...>> From server to client. A list of all active user names is sent to all clients, each time the list at the server changes.

Note:

This notation <<info>> indicates a placeholder, and they need to be replaced with appropriate content.

E.g.:

JOIN <<user_name>>, <<server_ip>>:<<server_port>>

Might look like this:

JOIN alice_92, 172.168.168.12:4578