

Assignment 2 - Socket Programming

The objective of this assignment is to practice socket programming by writing a chat application. The assignment consists of implementing two components: a *chat client* and a *chat server*. The server maintains information about the clients that have registered with a specific chat group and dispatches the messages sent by the clients.

Clients can communicate with others by registering with a group. All received messages (from other clients) should be sent to standard output. The server and clients should be invoked with:

- Server: `server [server_port_number]`
- Client: `client [server_host_name] [server_port_number] [client_name]`

After successfully contacting the server, the client should support the following commands:

- `join [groupID]`: registers the client with a group, allowing it to receive and send messages from/to the specified group.
- `send [groupID] [message]`: allows a client to send a message to a group.
- `leave [groupID]`: indicates that a client wants to stop sending and receiving messages.
- `quit`: closes the client application.

When a client joins a group, the server registers the client with the corresponding group. A client can be member of multiple groups simultaneously and duplicate join requests must be discarded. Similarly, when a client requests to leave a group, the server removes the client from the corresponding group; if a client tries to leave a group in which it is not a member, the request must be discarded. When the server receives a send request message for a group, the server delivers the message to all members of the group. The message format should be as follows: "ClientName: msg".

Hint: You should use `select()` in the server to perform multiplexing among the clients (i.e., no busy wait). `select()` allows a program to monitor multiple file descriptors (socket descriptor in our case), waiting until one or more of them become *ready*.

How to submit the assignment

You should zip all your source code and upload it through the edmodo forum.

Please use the following format to name your file:

`os_assignment<num>_group<num>.zip`

For example, if your group number is 5, you should submit:

`os_assignment2_group5.zip`

The deadline to submit this assignment is 1393/7/28 at 23:59.