

# Functionalities of code

a.) with multithreaded server

- **User Registration & Login :**  
Users can register and log in with a unique user ID.
- **Real-Time Messaging:**  
Supports broadcast messages and private messaging (both one-shot and continuous sessions).
- **Chat History:**  
Retrieve previous chat history between users.
- **Online User Listing:**  
Lists currently online users.
- **Registered User Listing:**  
Lists all registered users.
- **File Transfer:**  
Transfer files between users seamlessly.
- **Cloud Data Persistence:**  
All user information and chat data are stored in a cloud MongoDB database.
- **Offline Message Delivery:**  
When users are offline, incoming messages are saved in the cloud MongoDB and automatically delivered when they log in, ensuring no message is lost.
- **Modular Design:** The codebase is organized into separate modules for the server (client handling, database interactions, user management, and timeout handling) and client (UI, message receiving, and file transfers).

- **Timeout Handling:**
  - **User Inactivity:** After 500 seconds of inactivity, a user is automatically disconnected from the server.
  - **Server Shutdown:** If all users disconnect, the server will automatically shut down as well.

b.) server with select method

- **User Registration & Login:**  
Users can register and log in with a unique user ID.
- **Real-Time Messaging:**  
Supports broadcast messages and private messaging
- **Online User Listing:**  
Lists currently online users.
- **Registered User Listing:**  
Lists all registered users.
- **File Transfer:**  
Transfer files between users seamlessly.
- **Timeout Handling:**
  - **User Inactivity:** After 300 seconds of inactivity, a user is automatically disconnected from the server.
  - **Server Shutdown:** If all users disconnect, the server will automatically shut down as well.