

**AIN SHAMS UNIVERSITY**

**FACULTY OF ENGINEERING**

**CREDIT HOURS ENG. PROGRAM**

**Computer engineering and software systems**

**AIN SHAMS UNIVERSITY**

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**Phase 1: CSE 351**

**Project**

**Peer-to-Peer Multi-User Chatting Application**

**Submitted to:**

**Prof. Ayman M. Bahaa-Eldin**

**Submitted by:**

**Mohamed Mostafa Bedair El Maghraby 20p7732**

**Malak Mohamed Mahfouz Mohamed Sadek 20P7813**

**Mohamed Hesham El Said Zidan 20p7579**

**Ahmed Saif Elsayed Ibrahim Soliman 20P7668**

# Project Scope:

This project aims to provide a peer-to-peer Multi-User chatting application, using python and sockets, with a focus on text-based communication. It should be robust, optimized using data structure and algorithms to handle an increasing number of users and overall scalability, and easy to use, while also utilising command line interface and colour-coding which makes the application’s usage intuitive and appealing.

# List of Functionalities:

## 1. User Authentication:

* User should be able to create an account using a unique username and password or log in to an existing account if one exists.
* User should have his unique usernames used as his identifier for other users.
* User should be able to change his username if desired.

## 2. Basic Client-Server Setup:

* Users should be able to connect to the server using a client application.
* Users should be able to see a list of all the currently active users.

## 3. Chat Room Functionality:

* Users should be able to create or join a chat room.
* Users should be able to see a list of available chat rooms.
* The user that creates the chat room should be the group leader/admin.
* A Chat room admin should be able to remove other participants from the chat.
* When a chat room admin leaves the chat room, the second oldest member in the chat room should become the new admin.
* A chat room admin should be able to make other participants admins.

## 4. Group Messaging in Chat Rooms:

* Users should be able to send/see a message to/from everyone in the chat room.
* Users should receive notifications for new messages.
* Users can turn off notifications/mute from a chat room.

## 5. One-to-One Chat Functionality:

* Users can initiate one-to-one chat sessions, in which users can send/receive messages with only one user.
* Users should receive notifications for new private messages.
* Users can turn off notifications/mute from a user in private chat.

## 6. Message Formatting and Features:

* The application supports basic text formatting (e.g., bold, italics) in messages.
* Requirement: Users can share hyperlinks in messages, which opens a browser and redirects a user that clicked on it to a certain URL.

## 7. Error Handling and Resilience:

* The application implements robust error handling for unexpected scenarios. (for ex: invalid command or character entered)
* User should receive meaningful error messages for troubleshooting.
* Users are automatically reconnected in case of a network interruption.

## 8. User Interface (UI) Enhancements:

* The application implements a clean command line user interface, utilizing color-coded messages.
* User can identify different types of messages, for example usernames appears in a certain colour, notifications appear in a different colour and font, connection errors appear in a third different way. Etc