Socket Programming Assignment: Multi-Client Chat Application

In this assignment, you will develop a client-server chat application using socket programming and multi-threading in your preferred programming language (Python or C). This project will help you understand network programming, concurrent programming, and basic security concepts.

1. PART 1 : Core

1.1. Server Implementation

- Create a server that can handle multiple client connections simultaneously using threads
- Implement proper connection handling and error management
- Maintain a list of all connected clients
- Handle client disconnection gracefully
- Implement proper resource cleanup

1.2. Client Implementation

- Create a client application that can connect to the server
- Implement a simple command-line interface
- Enable sending and receiving messages
- Handle server disconnection gracefully
- Implement proper error handling

2. PART 2: Features

2.1. Private Channels

- Allow clients to create private chat rooms
- Implement join/leave functionality for private channels
- Ensure only authorized clients can access private channels

- Maintain a list of available channels

2.2.　　Broadcasting and Message Types

- Implement broadcast messaging to all clients

- Create different message types (broadcast, private, channel)

- Add support for basic commands (/help, /list, /join, /leave, etc.)

- Implement user presence notifications

2.3.　　User Management

- Implement basic user authentication

- Allow users to set and change nicknames

- Display active user list

- Show user status (online/offline)