**PROJECT 3 - SUMMARY**

**Project Objective:**

The objective of this project was to implement a messaging/communication system using socket programming

**Approach Used:**

I have implemented this project using JAVA. I first understood the program given by the professor and tried to connect my client and server by placing them on different system. I used a common port to make the connection.

After understanding the basic implementation, I Started implementing the project as per the requirement, one at a time.

In this implementation, there is need of multithreading, one thread per client. Also, all the messages exchanged between the clients happens through the server. Thus, server maintains a list of messages per user (map for user and user messages). This map must be synchronized otherwise in a multithreading environment; it could throw a concurrent modification exception in a situation where one thread is reading and other is writing. Thus, to avoid this problem I have used synchronization provided by threads in java.

Apart from that I faced some issue in understanding who the unknown users were and got my doubts clarified from TA and professor.

The program first asks the user to enter the username and validates it for duplicates by sending it to the server. The server does not allow the user with same name to have two connections and asks the user to enter some other name to continue. Once a valid name is given to by the user. The user is presented with multiple options and the questions are asked accordingly.

The user may exit and return at any point of time. The messages of disconnected users are still stored on the server.

I also tried to cover as many use cases as I could think of.

**Learning:**

The key learnings from this project are:

1. I learnt socket programming
2. I developed a capability to implement any tasks related to socket programming in future
3. Handle multiple buggy situations and make sure to cover the maximum possible scenarios / use cases
4. Importance of testing the code thoroughly

I also faced a couple of challenges while developing this project: because of the multithreading environment I had to use logging or print statements to debug. In a system having firewall on I was not able to connect to the server.

**Result:**

I successfully completed the project covering all the requirements and building an efficient messaging or communication system and added a couple of skills to my skillset.