

# Peer-to-Peer Chat Application – ThreadTalks

## **Introduction:**

The Peer-to-Peer Chat Application is a real-time communication system designed to enable seamless messaging between multiple users. Built using Java, the system utilizes socket programming and multithreading to manage concurrent connections and message routing.

## **Abstract:**

This project focuses on developing a robust chat platform where clients can exchange messages through a centralized server. It supports both group chats and private messaging. A minimal GUI built with JavaFX enhances user interaction, while basic encryption ensures message confidentiality. The system maintains logs and tracks user nicknames for better management.

## **Tools Used:**

- **Programming Language:** Java
- **Core Concepts:** Socket Programming, Multithreading
- **UI:** JavaFX
- **Security:** Basic Message Encryption

## **Steps Involved in Building the Project:**

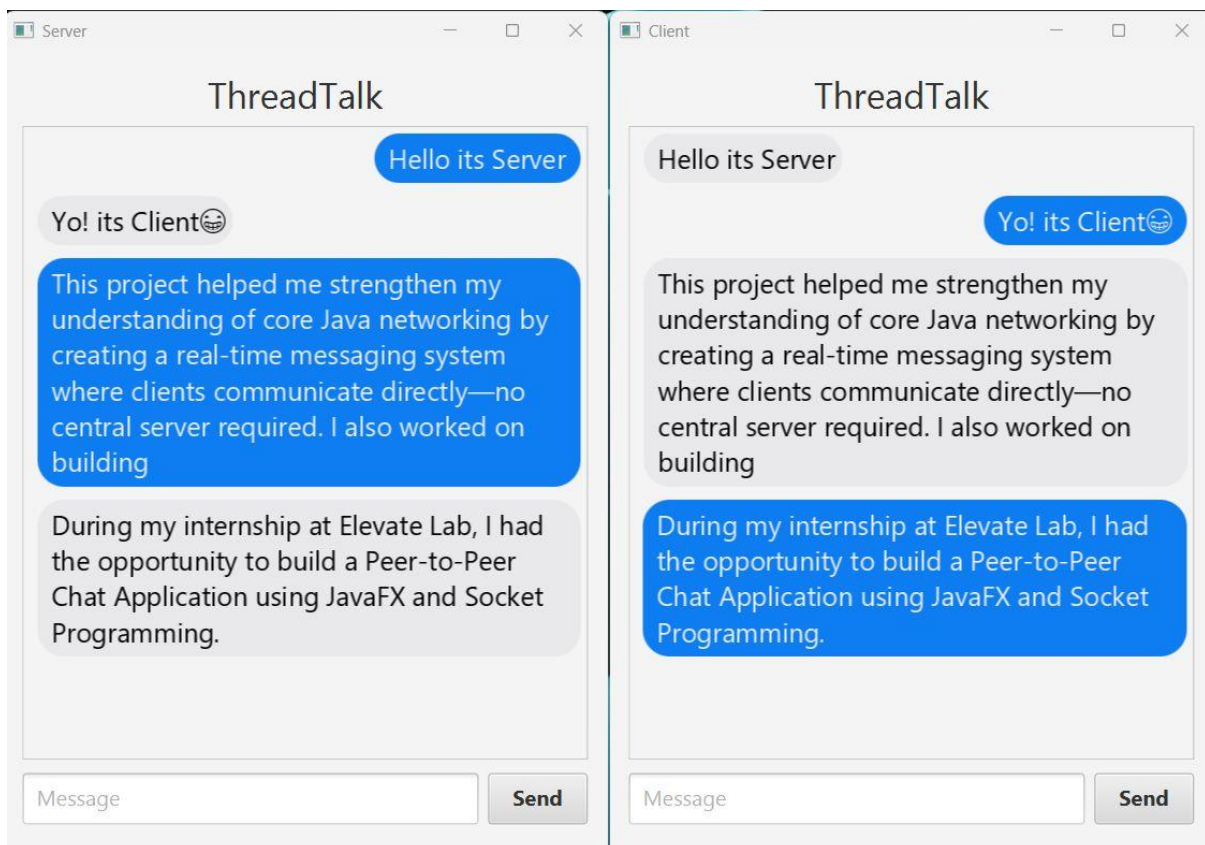
- **Server Setup:** Initialized ServerSocket to accept clients and handled each with a threaded ClientHandler.
- **Client Design:** Developed a JavaFX-based GUI with nickname support for better user identification.
- **Messaging Features:** Enabled group messaging via broadcast and private messaging using unique tags.

- **Security & Logs:** Applied simple encryption (like Caesar cipher/Base64) and logged user connections.
- **Testing:** Verified with multiple clients and captured demo screenshots (ss).

## Conclusion

The **Peer-to-Peer Chat Application** successfully demonstrates real-time messaging using Java sockets. Its modular structure and use of threading make it scalable and responsive. Future improvements could include file sharing, better encryption (SSL/TLS), and a persistent message database.

## Snapshot's:



**Project Link:** <https://github.com/viveksonawale/Elevate-Labs-Internship-Task/tree/main/Projects/ProjectChatApplication>