

VIETNAMESE – GERMAN UNIVERSITY
FACULTY OF ENGINEERING
COMPUTER SCIENCE DEPARTMENT

OPERATING SYSTEMS PROJECT REPORT
<Group Chat>

Module 61CSE215: Object Oriented Programming in JAVA

1. <Phạm Phú Tuấn Khoa – 10421129>
2. <Lý Minh Hùng – 10421079>
3. <Võ Phạm Khang Huy – 10421082>

Lecturer: Dr. Tran Hong Ngoc

Binh Duong, SS2024

Table of Contents

I.	Introduction	2
II.	Functionalities	2
III.	Experiment	2
IV.	Conclusion and Future Works	13
V.	Duty Roster	14
VI.	References	15

I. INTRODUCTION

The project is the box chat application that applied Multi-threading. People can basically host a server. Then others can join in that server and chat together.

II. FUNCTIONALITIES

- The application provides 2 main functions: hosting a server and login as a user.
- A person can create a server with not exceeding 5-digit integer input. A host can see the list of users that have been already registered to join the server. Moreover, a host could also manage the status of the server. For instance, start server, close port, and close server.
- Users can connect to the server that already exists, join the room, and chat with other users on the same server.

III. Experiment

1. Environment and Tools

a. Environment: Describe the physical resources (numbers of PCs, CPU, RAM, ...)

- Server application:
 - folder “server” size on disk: 48.0 KB (49,152 bytes)
 - RAM usage: approximately 175MB
 - Total processor utilization across all cores: 28% (my laptop’s processor has 8 CPUs, base speed approximate 1.8GHz).
- Chat application:
 - folder “chat” size on disk: 56.0 KB (57,344 bytes)

- RAM usage: approximately 55MB
- Total processor utilization across all cores: 0%

b. Tools:

IDE: Netbeans IDE, Eclipse IDE for Developers, JDK21.

Libraries:

- java.net.Socket
- java.net.ServerSocket
- java.io.BufferedReader
- java.io.BufferedWriter
- java.io.IOException
- java.io.InputStreamReader
- java.io.OutputStreamWriter
- java.util.ArrayList
- java.util.logging.Level
- java.util.logging.Logger
- java.awt
- javax.swing

2. Data

Input data:

- Server application: not exceeding 5-digit integer hosting room's number of servers, and press button host server or close port(to lock the room).
- Chat application: not exceeding the 5-digit integer of the room's number that you want to join, your name, and message(or string of chars) that you desire to send.

Output data:

- Server application: The status of server and the port status. which is displayed on GUI switch from OFF to ON(and vice versa),
- Chat application: Text message you type, and the text message you receive from other users.

3. GUI

Server GUI: contains

- One text box for input room's number data
- One button configuration(the upper button) is used for opening port or start server.

- One button (the lower one is used for closing port(lock the room). Then, others can not enter the room any more, meanwhile users who have already participated could chat normally.
- One panel showing server information(Number of users, server status, port Status)
- One panel showing a list of users with their registration name.

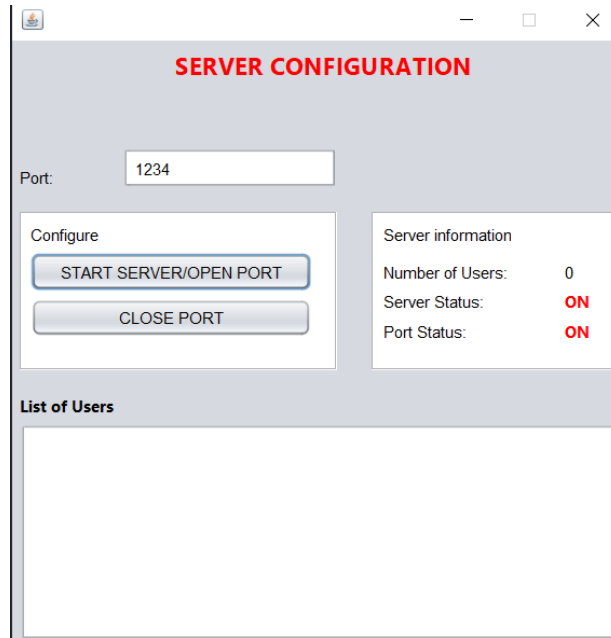
Tutorial for using Server hosting app:

Example:

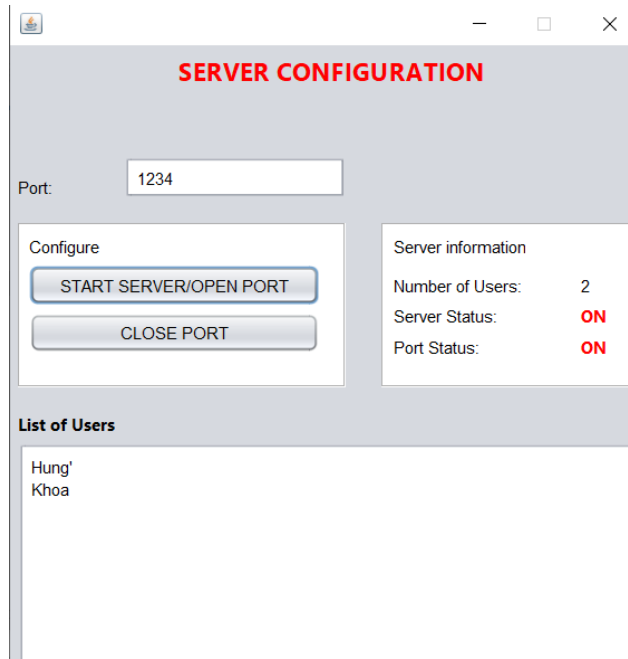
- when we have not inputted the room's number and hosted the server yet.

The screenshot shows a window titled "SERVER CONFIGURATION" with a light gray background. At the top, the title "SERVER CONFIGURATION" is displayed in red. Below the title, there is a "Port:" label followed by a text input field. Underneath the input field, there are two buttons: "START SERVER/OPEN PORT" and "CLOSE PORT". To the right of these buttons, there is a "Server information" panel. This panel contains three rows of information: "Number of Users:" with the value "NaN", "Server Status:" with the value "OFF" in red, and "Port Status:" with the value "OFF" in red. At the bottom of the window, there is a section titled "List of Users" followed by a large, empty rectangular area for displaying the list of users.

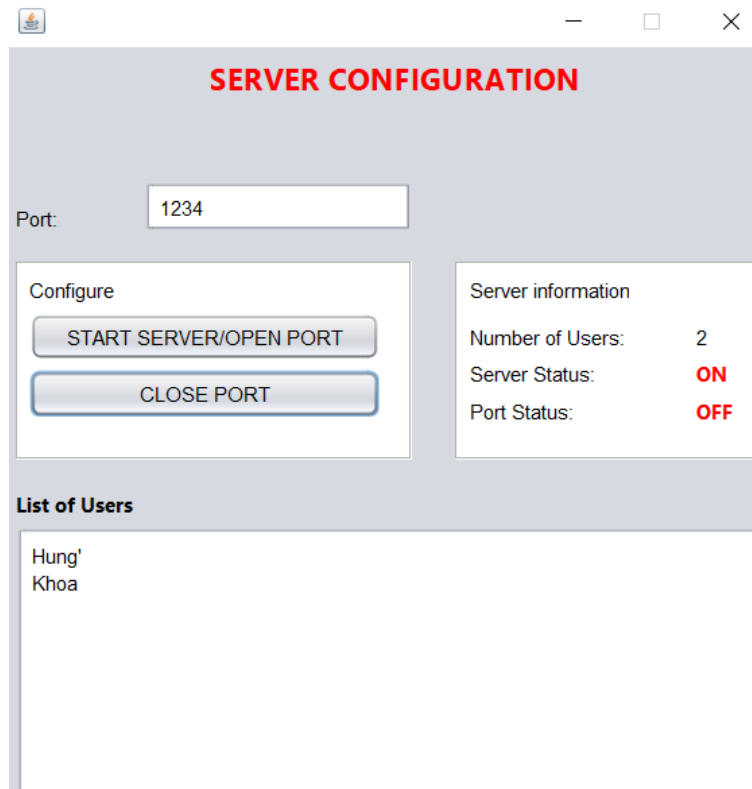
- When we host a server by not exceeding a 5-digit integer number (room's number is 1234 in this example). The number of users turns from NaN to 0. And the server and port status switch to ON.



- When there are 2 users enter the room:



- In this case, if you want to lock the room and avoid others to join the room anymore, you can press the “CLOSE PORT” button. Then, the port status will turn to “OFF”.



After hosting a server, then we would like to open chat app.
In case a host want to close the server, just end the application.

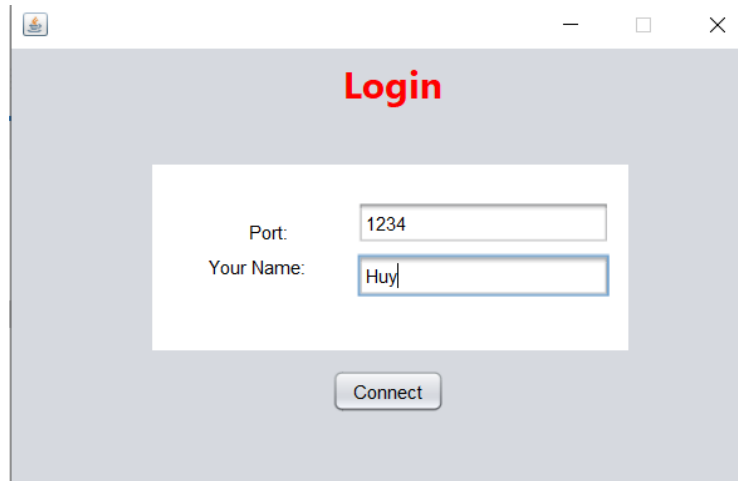
Chat application:

- **Login Interface:** contains
 - one text box for inputting room's number. (only allow number digit)
 - one text box for inputting registration name.
 - one button to verify that you connect to the room.
 - Other function: you can tab from port when typing to focus to Your Name text box. And Enter when you finish typing your information to Connect without pressing the “Connect” button.

Project: <Multithreading Group Chat>

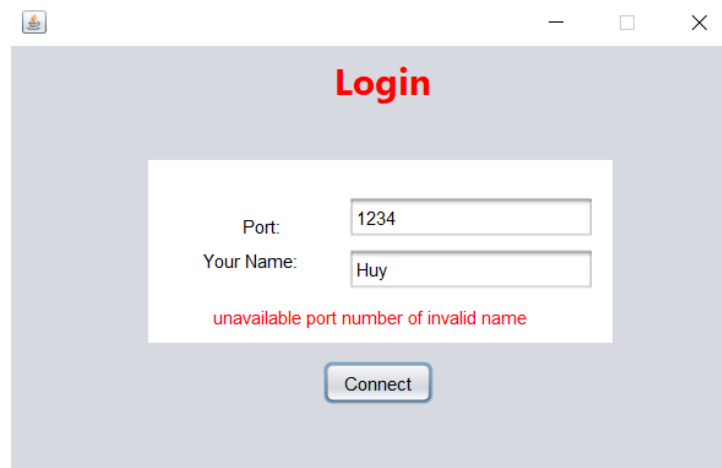
<Phạm Phú Tuấn Khoa - 10421129, Võ Phạm Khang Huy - 10421082, Lý Minh Hùng - 10421079>

Tutorial for logging in Chat app:
Example:



A screenshot of a web application window titled "Login". The window has a light gray background. In the center, there is a white rectangular box containing two input fields. The first field is labeled "Port:" and contains the text "1234". The second field is labeled "Your Name:" and contains the text "Huy". Below these fields is a button labeled "Connect". The window has standard Windows-style window controls (minimize, maximize, close) in the top right corner.

- When the port is opened(ON status), you would be forwarded to Chat Interface.
- When the port is closed, a text message will appear to inform you that you can't access the chat room because of some problems occurring.



A screenshot of the same "Login" web application window. The "Port:" field contains "1234" and the "Your Name:" field contains "Huy". Below the input fields, there is a red error message that reads "unavailable port number of invalid name". The "Connect" button is still visible below the error message. The window controls are in the top right corner.

When you login successfully, you will come to the chat interface.

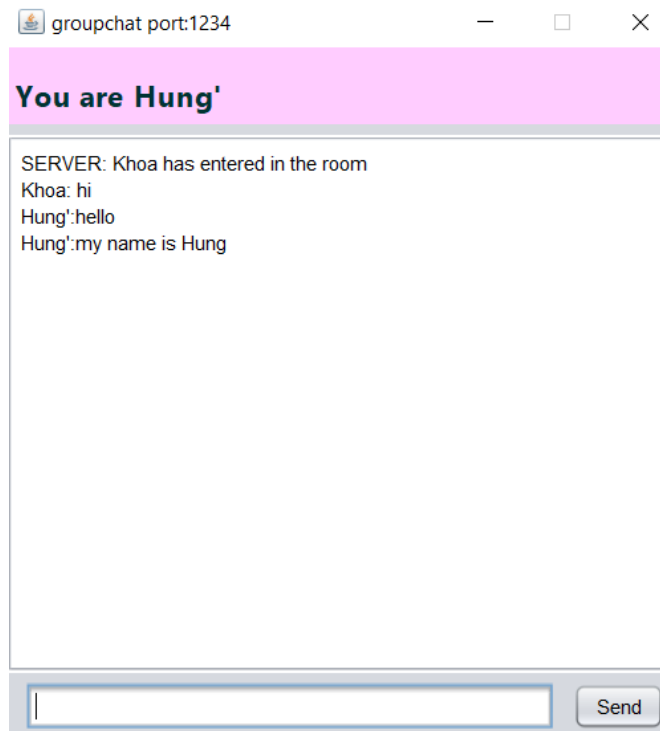
Chat interface: contains

- one area to show your registration name

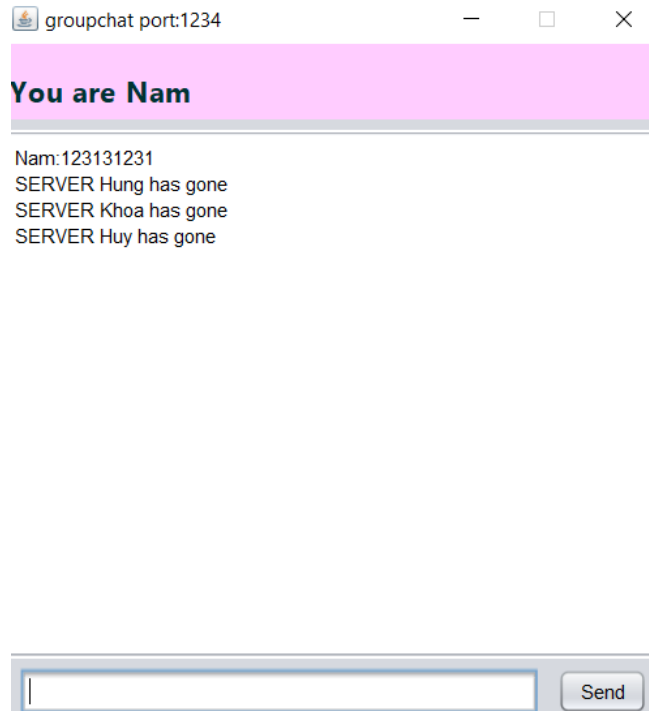
Project: <Multithreading Group Chat>

<Phạm Phú Tuấn Khoa - 10421129, Võ Phạm Khang Huy - 10421082, Lý Minh Hùng - 10421079>

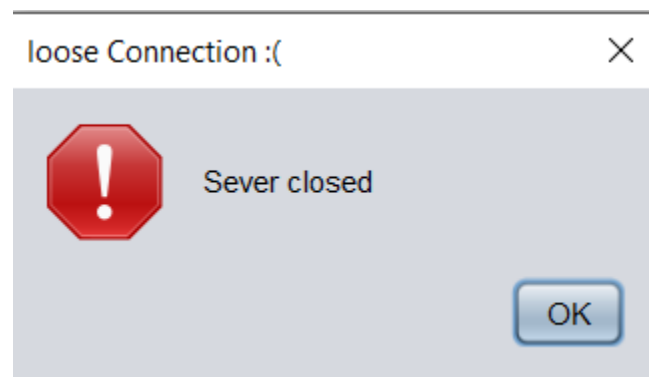
- one text area that show the message you send and receive
- one text box to input your message.
- one button to verify sending your message.
- Other function: you can send your message by pressing Enter as well.



- Here you can type your message and send it to chat with others in the room.
- When a user enter or leave the room, there will be a automatic notification in the chat



- But if the host ends the server by closing the Server app, the server will be deleted, and a notification box comes out to inform you that the server has been closed.



IV. Conclusion and Future works

In conclusion, our team has tried to apply multithreading to this box chat app. The **Server** app and the **Chat** app are able to provide basic functionalities of a chat system. These 2 apps can help users communicate together with basic steps. Besides, we still recognize some mistakes in the development process(planning, coding and communication), and plenty of functionality like online chatting, chat area design, Server reopening, etc. Therefore, we will try our best to update new features, and design as well in order to bring my client a smoother experience in the future.

In future work, we would like to update the chat area, in which the message you receive will be aligned to the right of the chat area. Moreover, you would have a system of emoji and especially a “Like” button. To give a better experience, we would optimize the app for fewer RAM usage and provide a more friendly-use interface to users.

DUTY ROSTER

ID	Task	In Charge	Start	End	State	Note
1	Code login and server main function	Phạm Phú Tuấn Khoa	2-Dec-24	1-Jan-24	Done	
2	Design GUI for Login, Server, and Chat	V	01-Jan-224	2-Jan-24	Done	
3	Add some function: tab key, enter key press for GUI, export apps	Lý Minh Hùng	02-Jan-24		Done	Update some small function for convenience in use, export 2 apps for clients use

Project: <Multithreading Group Chat>

<Phạm Phú Tuấn Khoa - 10421129, Võ Phạm Khang Huy - 10421082, Lý Minh Hùng - 10421079>

						without open IDE
4	Report writing	Lý Minh Hùng	12-Jan- 24	14-Jan-24	Done	

REFERENCE

1. <https://www.youtube.com/watch?v=gLfuZrrfKes&t=150s>

APPENDIX A