CS359 Computer Networks Lab

Assignment 4

Implement a Peer-to-Peer Chat Application

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Documentation

In this assignment I have developed a peer-to-peer (P2P) chat application. In a P2P application, there are no dedicated central server nodes. Every node in the network can connect with each other and transfer data among themselves.

In this P2P chat application, I have considered five friends who want to chat with each other. This application uses TCP as the transport layer protocol. Each instance of the chat application run by a user, runs a peer-chat server (which is actually a TCP server) where the chat application listens for connections from other users. The same process of the application also runs one or multiple TCP clients (based on the number of peers) to connect to the other users and transfer messages. The entire application runs as a single process.

Compilation:

A makefile was included in the submission. For compilation, use "**make**" command.

```
┌─[maheeth@maheeth-PC:~/D/netlab4]─[01:21:28  IST]
└─>$ make
gcc ass4.c -o ass4
┌─[maheeth@maheeth-PC:~/D/netlab4]─[01:21:29  IST]
└─>$
```

makefile

```
all: ass4.c
    gcc ass4.c -o ass4

clean:
    rm ass4
```

Running Procedure:

To run the program, type **./ass4** in the terminal.

```
┌─[maheeth@maheeth-PC:~/D/netlab4]─[02:59:14  IST]
└─>$ ./ass4
Users Information:
        ID      Name    IP Address      Port
        ---------------------------------
        0       frnd0   127.0.0.1       2020
        1       frnd1   127.0.0.1       2021
        2       frnd2   127.0.0.1       2022
        3       frnd3   127.0.0.1       2023
        4       frnd4   127.0.0.1       2024

Choose a user-id: 0

Welcome "frnd0"!
        To message a friend use the format: friendname/<msg>
        To exit, type "quit"
Start Chatting!

```

The table shown above when the conversation starts is shared a priori to the users. The table contains info of the users such as User-ID, name, IP address and port number.

When the application is started, the user needs to enter their id to begin chatting. These are shown in the screenshot above.

Chatting with other users:

To chat with another user, the message format is: **friendname**/<**msg**> where **friendname** is the name of the friend to whom the user wants to send message, and **msg** is the corresponding message.

Sample Session:

frnd0

```
        2       frnd2   127.0.0.1       2022
        3       frnd3   127.0.0.1       2023
        4       frnd4   127.0.0.1       2024

Choose a user-id: 0

Welcome "frnd0"!
        To message a friend use the format: friendname/<msg>
        To exit, type "quit"
Start Chatting!

frnd1/Hi there! How are you?
frnd1 : Hello! I am fine thank you.
frnd3 : Hello! Long time no see?
frnd3/Yeah!been bit busy
quit
Session ended
┌─[maheeth@maheeth-PC:~/D/netlab4]─[02:47:51  IST]
└─>$
```

frnd1

```
        ------------------------------------
        0       frnd0   127.0.0.1       2020
        1       frnd1   127.0.0.1       2021
        2       frnd2   127.0.0.1       2022
        3       frnd3   127.0.0.1       2023
        4       frnd4   127.0.0.1       2024

Choose a user-id: 1

Welcome "frnd1"!
        To message a friend use the format: friendname/<msg>
        To exit, type "quit"
Start Chatting!

frnd0 : Hi there! How are you?
frnd0/Hello! I am fine thank you.
frnd2/Hola! Hope you are doing well!
frnd2 : Hey! Good to hear from you! I am doing pretty well.
```

frnd2

```
        ------------------------------------
        0       frnd0   127.0.0.1       2020
        1       frnd1   127.0.0.1       2021
        2       frnd2   127.0.0.1       2022
        3       frnd3   127.0.0.1       2023
        4       frnd4   127.0.0.1       2024

Choose a user-id: 2

Welcome "frnd2"!
        To message a friend use the format: friendname/<msg>
        To exit, type "quit"
Start Chatting!

frnd1 : Hola! Hope you are doing well!
frnd1/Hey! Good to hear from you! I am doing pretty well.
frnd3/Wassup man?
frnd3 : Hey man! I just turned 21 now.
```

frnd3

```
        ------------------------------------
        0       frnd0   127.0.0.1       2020
        1       frnd1   127.0.0.1       2021
        2       frnd2   127.0.0.1       2022
        3       frnd3   127.0.0.1       2023
        4       frnd4   127.0.0.1       2024

Choose a user-id: 3

Welcome "frnd3"!
        To message a friend use the format: friendname/<msg>
        To exit, type "quit"
Start Chatting!

frnd2 : Wassup man?
frnd2/Hey man! I just turned 21 now.
frnd0/Hello! Long time no see?
frnd0 : Yeah!been bit busy
```

From the above screenshots, notice that the application is always ready to accept a new message from another user, unless the current user is entering a message. This is called asynchronous communication.

When the user types "**quit**" in the application, the session ends. See the screenshot for user frnd0.