COL 672-ASSIGNMENT- 2
Computer Networks

How to run?

There are two files: client.py and server.py, in the src folder.

Program client.py will run on client machine and program server.py will run on server machine.

Multiple client programs can be run on different terminals.

Client.py program:

This program is client side application.

Initially command line input is taken for the username(eg:localhost) and server's IP address(eg:127.0.0.1),server's port(eg:8004).

Then two TCP sockets are opened :

1) clientSocket1: for sending messages to other users,

2) clientSocket2: for receiving messages.

After which, clientSocket1sends register message with a username to server. If response message from server is successful, then receiving socket-clientSocket2 sends register message with username to server otherwise both the sockets are closed.

After a successful registration, two threads are created-

1.) read_input- reads input messages which are given by user, along with the username of the receiving client, then sends the message to the server.

After getting a response from a server, it informs client about whether a successful response is received or error response is received. If received response is Error 103 then "Header incomplete r wrong content length" is printed on screen or if received response is Error 101 then "no such user is registered" is printed on screen. If message is successfully delivered, then "Message delivered" is printed on screen.

2.) read_forward- receives forward messages from server -that is incoming messages from other users via server. Also if in incoming messages, header is found to be incomplete (by checking size) then ERROR 103 HEADER INCOMPLETE response is send to server, otherwise RECEIVED response is send to server. If message is successfully received then message is printed on screen.

Server.py program:

This program is server side application. Initially server binds its socket at server port then starts listening. I have chosen server port as 8004.

Two hash tables: clients_recv and clients_send are created to maintain mapping between username and corresponding socket.

Server first checks if any registration messages are received , if so it acknowledges by sending REGISTERED TOSEND {USERNAME} message to sending side of client and REGISTERED TORECV {USERNAME} message to receiving side of client. After which registering thread for sending socket remains active for sending messages to be delivered to another user but registering thread for receiving socket closes.

Also two hash tables clients_recv and clients_send are updated with username and corresponding receiving and sending socket.

Sending thread runs an infinite loop and wait to receive the message that is to be delivered to other user. Hash table clients_recv is looked for socket corresponding to recipient username.

If recipient username is not present in hash table clients_recv ,clients_send then “error 101 No user registered” message is send back to the sender.

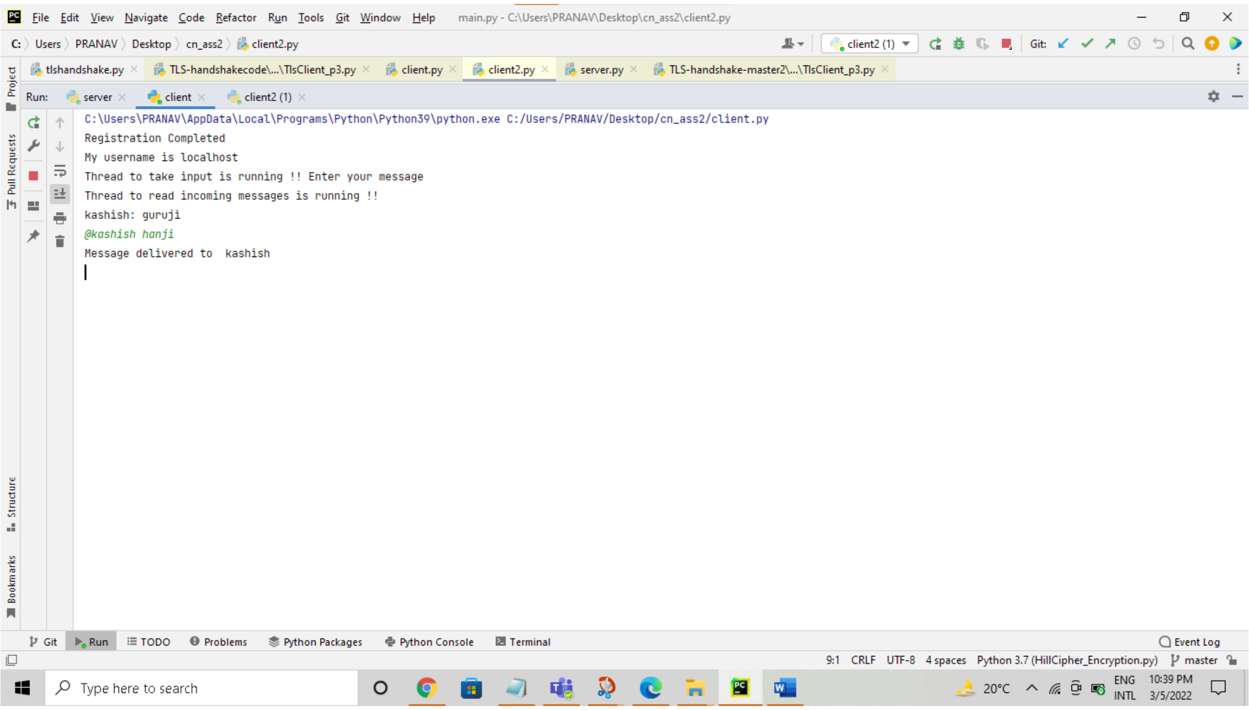
It is also checked whether the message is to be send to all recipients or not. If message is to be send to all recipients then all_recipients function is called which runs a loop for every recipient and send the message.

Otherwise if message is to delivered to specific recipient then not_all_recipient function is called which delivers message to specific recipient by looking for corresponding socket from hash table and then waits to receive a response from recipient, so that it can be verified that the message is successfully received or not.

If “error 103 header incomplete” or “error 102 unable to send” is found then corresponding functions error_103 and error_102 are called.

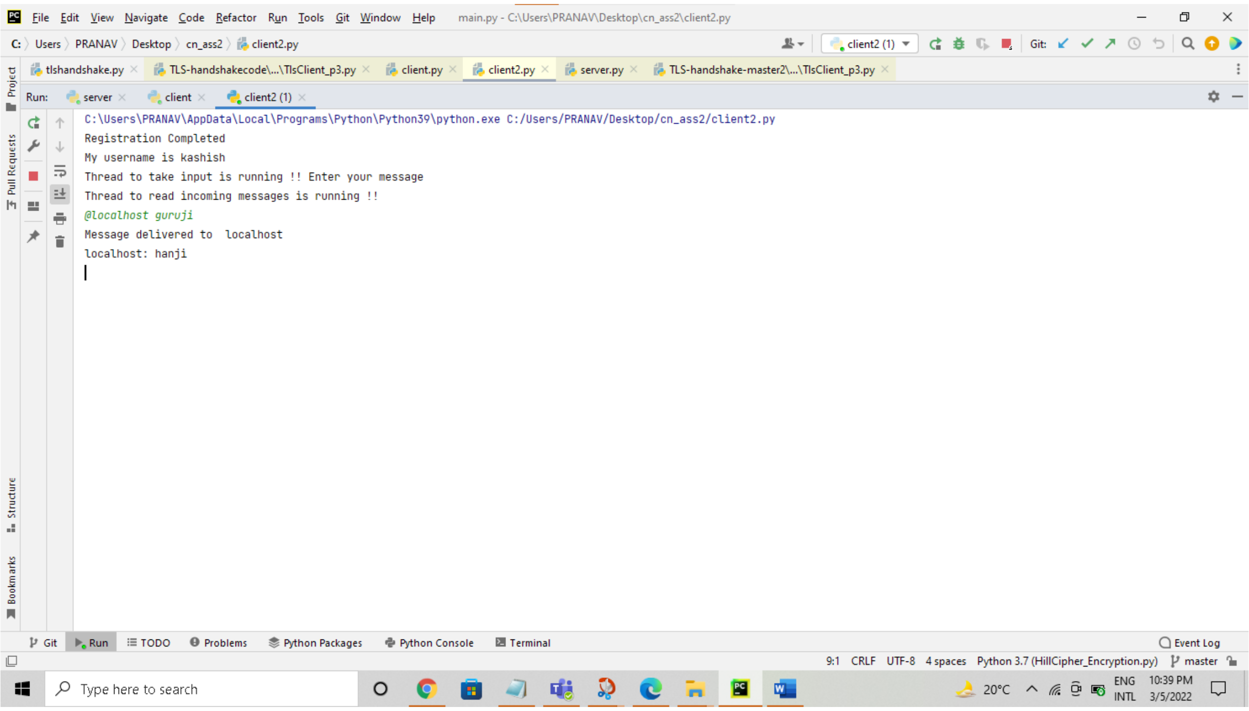
This will run until users are communicating.

RESULTS:


File Edit View Navigate Code Refactor Run Tools Git Window Help
main.py - C:\Users\PRANAV\Desktop\cn_ass2\client2.py
C: 〉 Users 〉 PRANAV 〉 Desktop 〉 cn_ass2 〉 client2.py
client2 (1)
Git:
tlshandshake.py
TLS-handshakecode\...\TlsClient_p3.py
client.py
client2.py
server.py
TLS-handshake-master2\...\TlsClient_p3.py
Run:
server
client
client2 (1)
Project
Pull Requests
Structure
Bookmarks
Git
Run
TODO
Problems
Python Packages
Python Console
Terminal
Event Log
9:1 CRLF UTF-8 4 spaces Python 3.7 (HillCipher_Encryption.py) master
Type here to search
20°C
ENG
INTL
10:39 PM
3/5/2022

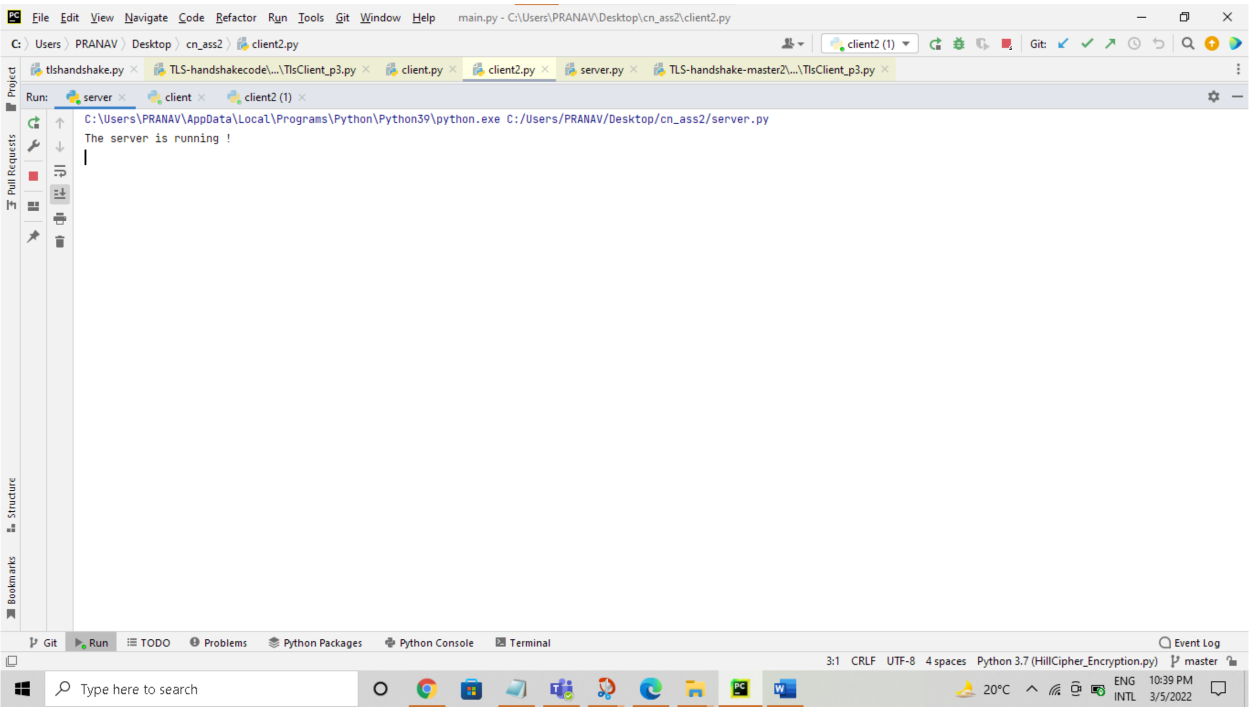
```
C:\Users\PRANAV\AppData\Local\Programs\Python\Python39\python.exe C:/Users/PRANAV/Desktop/cn_ass2/client.py
Registration Completed
My username is localhost
Thread to take input is running !! Enter your message
Thread to read incoming messages is running !!
kashish: guruji
@kashish hanji
Message delivered to  kashish
```

Client- “localhost” sending message to Client-“ kashish”


File Edit View Navigate Code Refactor Run Tools Git Window Help main.py - C:\Users\PRANAV\Desktop\cn_ass2\client2.py
C: Users PRANAV Desktop cn_ass2 client2.py
tlshandshake.py TLS-handshakecode\...\TlsClient_p3.py client.py client2.py server.py TLS-handshake-master2\...\TlsClient_p3.py
Run: server client client2 (1)
Git Run TODO Problems Python Packages Python Console Terminal Event Log
9:1 CRLF UTF-8 4 spaces Python 3.7 (HillCipher_Encryption.py) master
Type here to search
20°C ENG INTL 10:39 PM 3/5/2022

```
C:\Users\PRANAV\AppData\Local\Programs\Python\Python39\python.exe C:/Users/PRANAV/Desktop/cn_ass2/client2.py
Registration Completed
My username is kashish
Thread to take input is running !! Enter your message
Thread to read incoming messages is running !!
@localhost guruji
Message delivered to  localhost
localhost: hanji
```

Client- “kashish” sending message to Client- “Localhost”


File Edit View Navigate Code Refactor Run Tools Git Window Help main.py - C:\Users\PRANAV\Desktop\cn_ass2\client2.py
C: Users PRANAV Desktop cn_ass2 client2.py
tlshandshake.py TLS-handshakecode\...\TlsClient_p3.py client.py client2.py server.py TLS-handshake-master2\...\TlsClient_p3.py
Run: server client client2 (1)
Git Run TODO Problems Python Packages Python Console Terminal Event Log
3:1 CRLF UTF-8 4 spaces Python 3.7 (HillCipher_Encryption.py) master
Type here to search
20°C ENG INTL 10:39 PM 3/5/2022

```
C:\Users\PRANAV\AppData\Local\Programs\Python\Python39\python.exe C:/Users/PRANAV/Desktop/cn_ass2/server.py
The server is running !
```

Server is running