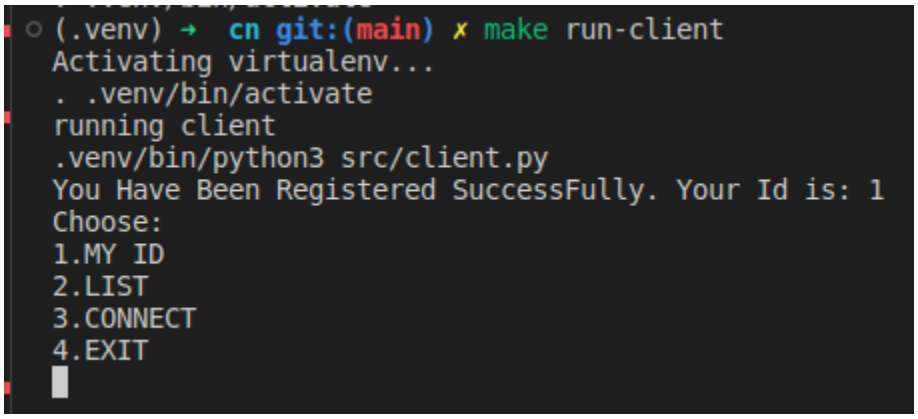
Operation of the code:

The client code is written in the client.py file, and the server code in the server.py file. The protocol includes messages defined in utils.py and the ProtocolMessages class. Additionally, on the server side, we have a database that stores the IDs and addresses of the clients.

Client:

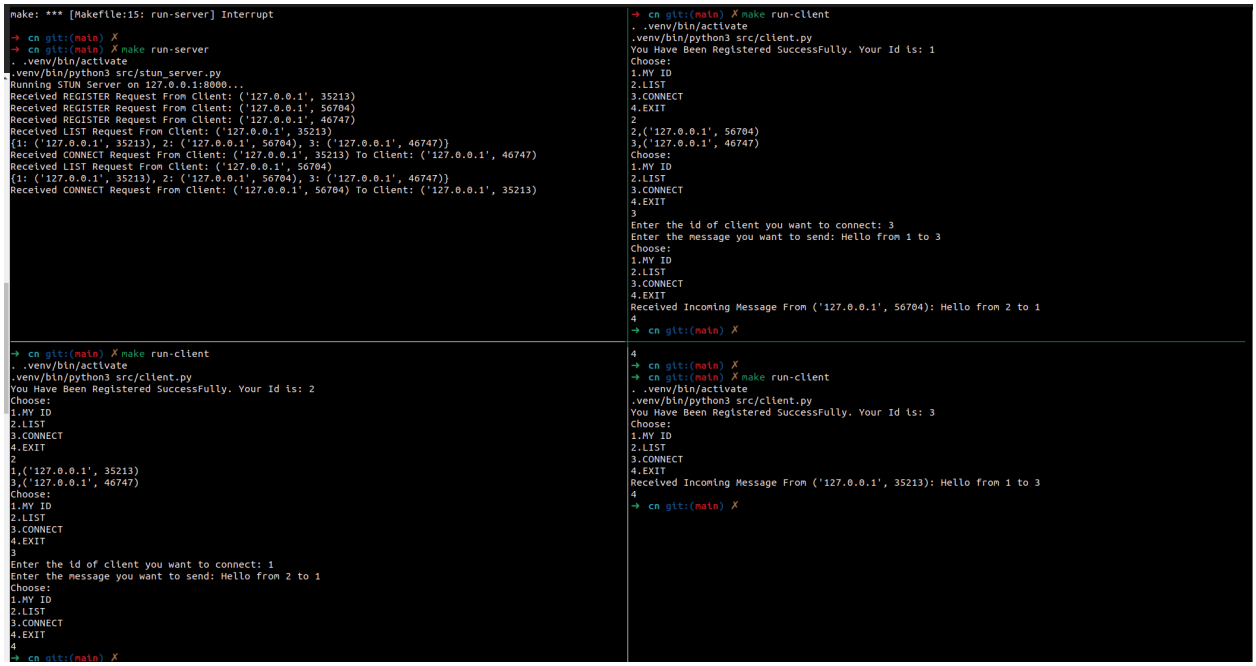
Initially, when the client code is executed, a REGISTER request is sent to the server. Once REGISTER_ACK is received by the client, two threads are run: one thread waits for message reception on a socket, and the other allows execution of commands on the client using the command line. The commands are as follows:



The LIST command sends a LIST request and receives a LIST_ACK in response from the server. The CONNECT command takes the input of the client ID we intend to message and the message to be sent. Then, the client sends a CONNECT request with the client ID.
On receiving CONNECT_ACK from the server (the thread waiting for message reception), the IP and port of the other client are obtained, and the entered message is sent to that destination. Also, if a message comes from another client, it is displayed.

Server:

The server listens on the entered port and performs the corresponding action for each request received.


make: *** [Makefile:15: run-server] Interrupt
→ cn git:(main) ✗
→ cn git:(main) ✗ make run-server
. .venv/bin/actlvate
. venv/bin/python3 src/stun_server.py
Running STUN Server on 127.0.0.1:8000...
Received REGISTER Request From Client: ('127.0.0.1', 35213)
Received REGISTER Request From Client: ('127.0.0.1', 56704)
Received REGISTER Request From Client: ('127.0.0.1', 46747)
Received LIST Request From Client: ('127.0.0.1', 35213)
{1: ('127.0.0.1', 35213), 2: ('127.0.0.1', 56704), 3: ('127.0.0.1', 46747)}
Received CONNECT Request From Client: ('127.0.0.1', 35213) To Client: ('127.0.0.1', 46747)
Received LIST Request From Client: ('127.0.0.1', 56704)
{1: ('127.0.0.1', 35213), 2: ('127.0.0.1', 56704), 3: ('127.0.0.1', 46747)}
Received CONNECT Request From Client: ('127.0.0.1', 56704) To Client: ('127.0.0.1', 35213)
→ cn git:(main) ✗ make run-client
. .venv/bin/activate
.venv/bin/python3 src/client.py
You Have Been Registered SuccessFully. Your Id is: 1
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
2
2,('127.0.0.1', 56704)
3,('127.0.0.1', 46747)
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
3
Enter the id of client you want to connect: 3
Enter the message you want to send: Hello from 1 to 3
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
Received Incoming Message From ('127.0.0.1', 56704): Hello from 2 to 1
4
→ cn git:(main) ✗
→ cn git:(main) ✗ make run-client
. .venv/bin/activate
.venv/bin/python3 src/client.py
You Have Been Registered SuccessFully. Your Id is: 2
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
2
1,('127.0.0.1', 35213)
3,('127.0.0.1', 46747)
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
3
Enter the id of client you want to connect: 1
Enter the message you want to send: Hello from 2 to 1
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
4
→ cn git:(main) ✗
4
→ cn git:(main) ✗
→ cn git:(main) ✗ make run-client
. .venv/bin/activate
.venv/bin/python3 src/client.py
You Have Been Registered SuccessFully. Your Id is: 3
Choose:
1.MY ID
2.LIST
3.CONNECT
4.EXIT
Received Incoming Message From ('127.0.0.1', 35213): Hello from 1 to 3
4
→ cn git:(main) ✗