

## Lab Assignment-5

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Server.py code:

```
import threading
import socket
host = '0.0.0.0'
port = 8000

# To store the active client sockets
clients = []

# To store corresponding usernames of the clients
usernames = []

# send message to all the clients
def broadcast(message):
    for client in clients:
        client.send(message)
```

```
# receive messages from a client and send it to all the clients
def handleClient(client, addr):
    while True:
        try:
            message = client.recv(1024)
            broadcast(message)
        except:
            index = clients.index(client)
            username = usernames[index]
            clients.remove(client)
            client.close()
            broadcast(f'{username} has left the chat room!'.encode('utf-8'))
            usernames.remove(username)
            break
```

```

# Initialize the server
def startServer():
    serverSocket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    serverSocket.bind((host, port))
    serverSocket.listen()
    print('Server is running and listening on PORT:', port)
    while True:
        connectionSocket, addr = serverSocket.accept()
        print("Connection received from client", addr)

        # ask for username from the client
        connectionSocket.send('Enter your username: '.encode('utf-8'))

        # store the client's information
        username = connectionSocket.recv(1024).decode()
        usernames.append(username)
        clients.append(connectionSocket)
        print('Username of the client: ', username)
        broadcast(f'{username} joined the chat room'.encode('utf-8'))
        connectionSocket.send('Connected to the chat room...'.encode('utf-8'))

        # create thread to handle the messages from the client
        thread = threading.Thread(target=handleClient, args=(connectionSocket, addr))
        thread.start()

if __name__ == "__main__":
    startServer()

```

#### Client.py code:

```

import threading
import socket

username = input('Enter your username: ')
clientSocket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

```

```

# receive messages from the server
def clientReceive():
    # receive the first message from the server asking for username
    try:
        message = clientSocket.recv(1024)
        serverMessage = 'Enter your username: '.encode('utf-8')

        # send the username to the server
        if message == serverMessage:
            clientSocket.send(username.encode('utf-8'))
    except:
        print('Error!')
        clientSocket.close()
        return

# receive other messages from the server and print it
while True:
    try:
        message = clientSocket.recv(1024)
        print(message.decode('utf-8'))
    except:
        print('Error!')
        clientSocket.close()
        break

```

```

# Send the messages of the client to the server so that server could broadcast it to all other clients
def clientSend():
    while True:
        message = f'{username}: {input("")}'
        clientSocket.send(message.encode('utf-8'))

# Start connection to the server to send and receive messages
def startClient():
    # Connect to the server
    clientSocket.connect(('192.168.56.1', 8000))

    # Create threads for receiving and sending messages
    receiverThread = threading.Thread(target=clientReceive)
    receiverThread.start()
    senderThread = threading.Thread(target=clientSend)
    senderThread.start()

if __name__ == "__main__":
    startClient()

```

### After everyone joins:

Server side terminal once everyone joins:

```
C:\Users\Siddharth\Documents\Networks Lab Assignment\Lab5>server.py
Server is running and listening on PORT: 8000
Connection received from client ('192.168.56.1', 58915)
Username of the client: Raj
Connection received from client ('192.168.56.1', 58916)
Username of the client: Sid
Connection received from client ('192.168.56.1', 58917)
Username of the client: Harsh
```

### **Client side terminal:**

Terminal of user with username Raj (joins first):

```
C:\Users\Siddharth\Documents\Networks Lab Assignment\Lab5>client.py
Enter your username: Raj
Raj joined the chat room
Connected to the chat room...
Sid joined the chat room
Harsh joined the chat room
```

Terminal of user with username Sid (joins second):

```
C:\Users\Siddharth\Documents\Networks Lab Assignment\Lab5>client.py
Enter your username: Sid
Sid joined the chat room
Connected to the chat room...
Harsh joined the chat room
```

Terminal of user with username Harsh (Joins third):

```
C:\Users\Siddharth\Documents\Networks Lab Assignment\Lab5>client.py
Enter your username: Harsh
Harsh joined the chat room
Connected to the chat room...
```

### Chat room after some chats:

(Terminal of user with username Raj):

```
Hi, Raj here
Raj: Hi, Raj here
Sid: Hello, I am Sid
Harsh, Are you there?
Raj: Harsh, Are you there?
Harsh: Yes brother, I am here
Sid: Great, everyone is here
```

(Terminal of user with username Sid):

```
Raj: Hi, Raj here
Hello, I am Sid
Sid: Hello, I am Sid
Raj: Harsh, Are you there?
Harsh: Yes brother, I am here
Great, everyone is here
Sid: Great, everyone is here
```

(Terminal of user with username Harsh):

```
Raj: Hi, Raj here
Sid: Hello, I am Sid
Raj: Harsh, Are you there?
Yes brother, I am here
Harsh: Yes brother, I am here
Sid: Great, everyone is here
```