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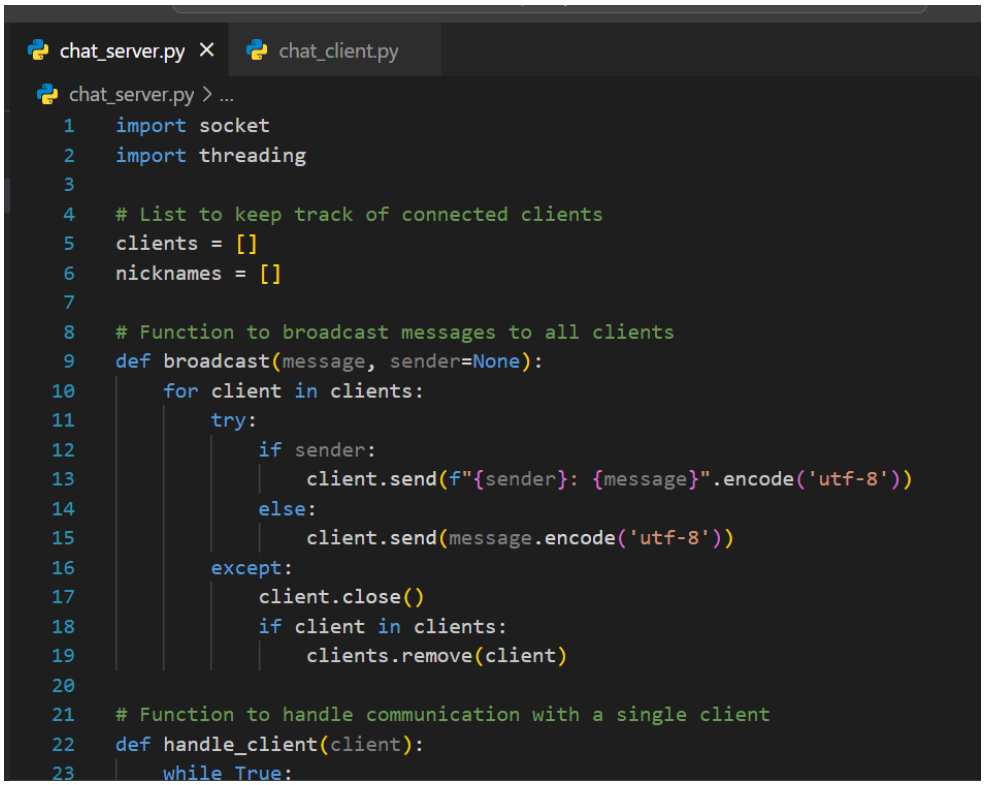
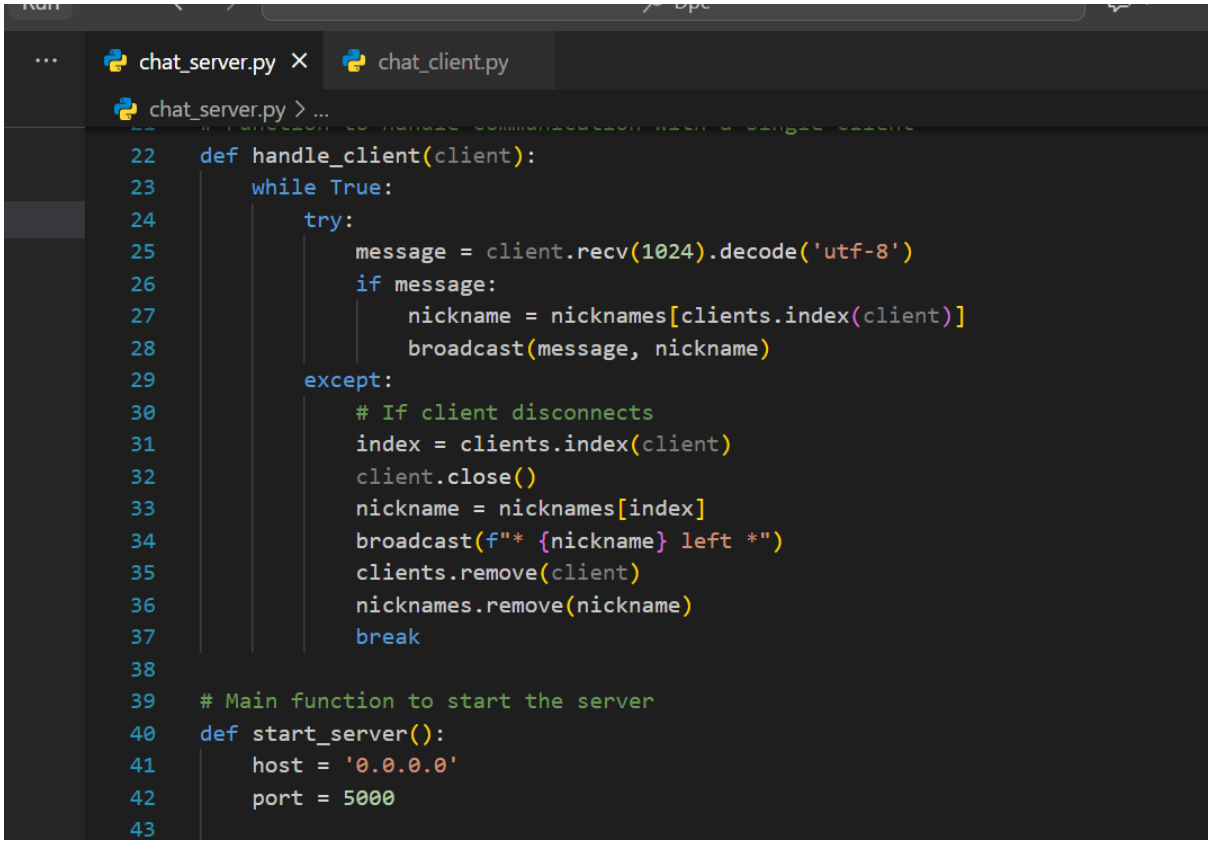
Distributed and Parallel Computing

Chat_server.py



```python
import socket
import threading

# List to keep track of connected clients
clients = []
nicknames = []

# Function to broadcast messages to all clients
def broadcast(message, sender=None):
    for client in clients:
        try:
            if sender:
                client.send(f"{sender}: {message}".encode('utf-8'))
            else:
                client.send(message.encode('utf-8'))
        except:
            client.close()
            if client in clients:
                clients.remove(client)

# Function to handle communication with a single client
def handle_client(client):
    while True:
```

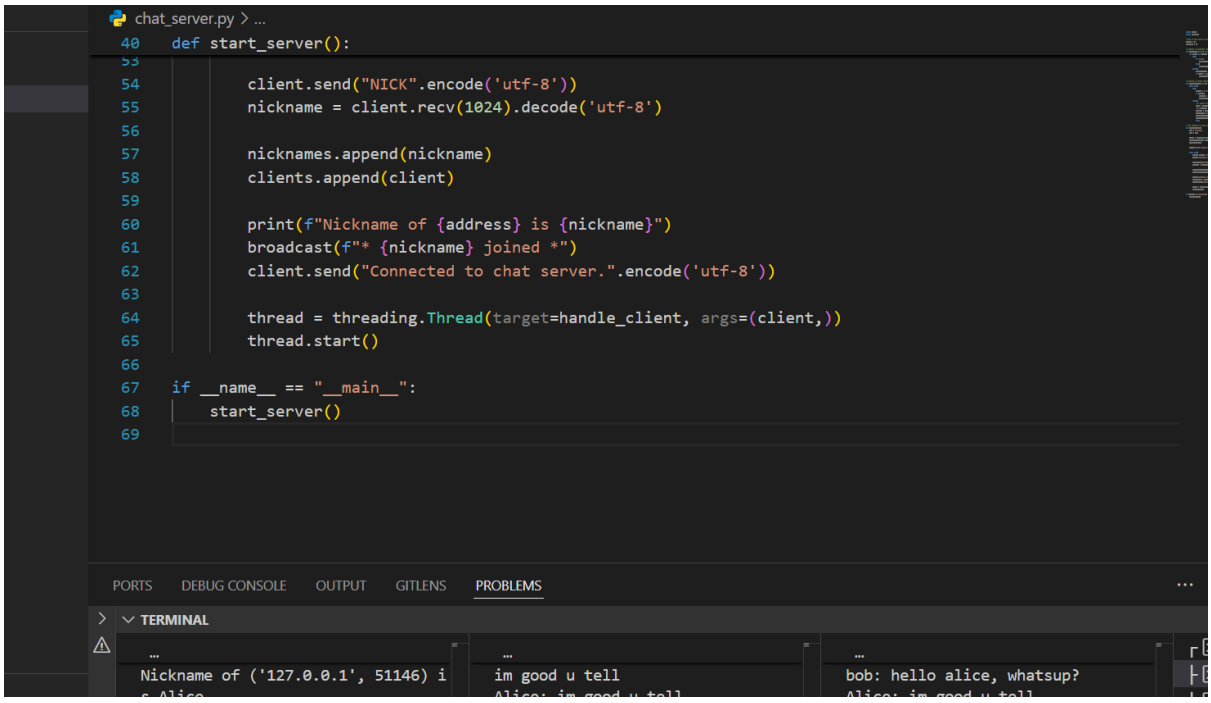


```python
def handle_client(client):
    while True:
        try:
            message = client.recv(1024).decode('utf-8')
            if message:
                nickname = nicknames[clients.index(client)]
                broadcast(message, nickname)
        except:
            # If client disconnects
            index = clients.index(client)
            client.close()
            nickname = nicknames[index]
            broadcast(f"* {nickname} left *")
            clients.remove(client)
            nicknames.remove(nickname)
            break

# Main function to start the server
def start_server():
    host = '0.0.0.0'
    port = 5000
```

chat_server.py chat_client.py

chat_server.py > ...

```
40  def start_server():
44      server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
45      server.bind((host, port))
46      server.listen()
47
48      print(f"[chat] Server started on {host}:{port}")
49
50      while True:
51          client, address = server.accept()
52          print(f"Connected with {address}")
53
54          client.send("NICK".encode('utf-8'))
55          nickname = client.recv(1024).decode('utf-8')
56
57          nicknames.append(nickname)
58          clients.append(client)
59
60          print(f"Nickname of {address} is {nickname}")
61          broadcast(f"* {nickname} joined *")
62          client.send("Connected to chat server.".encode('utf-8'))
63
64          thread = threading.Thread(target=handle_client, args=(client,))
```



Chat_client.py

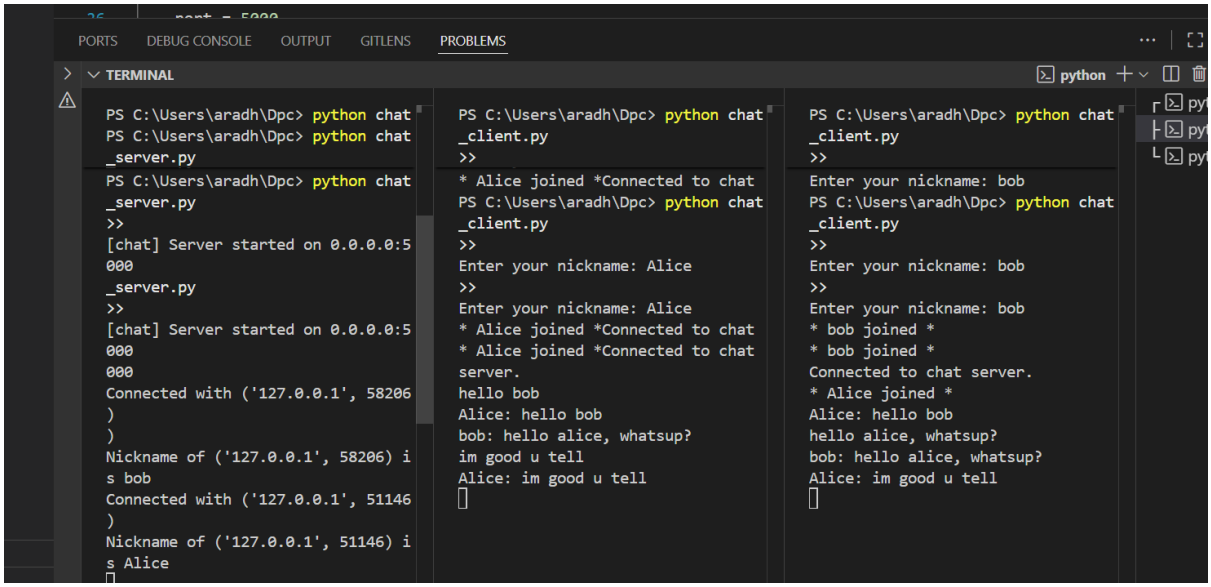
chat_client.py > ...

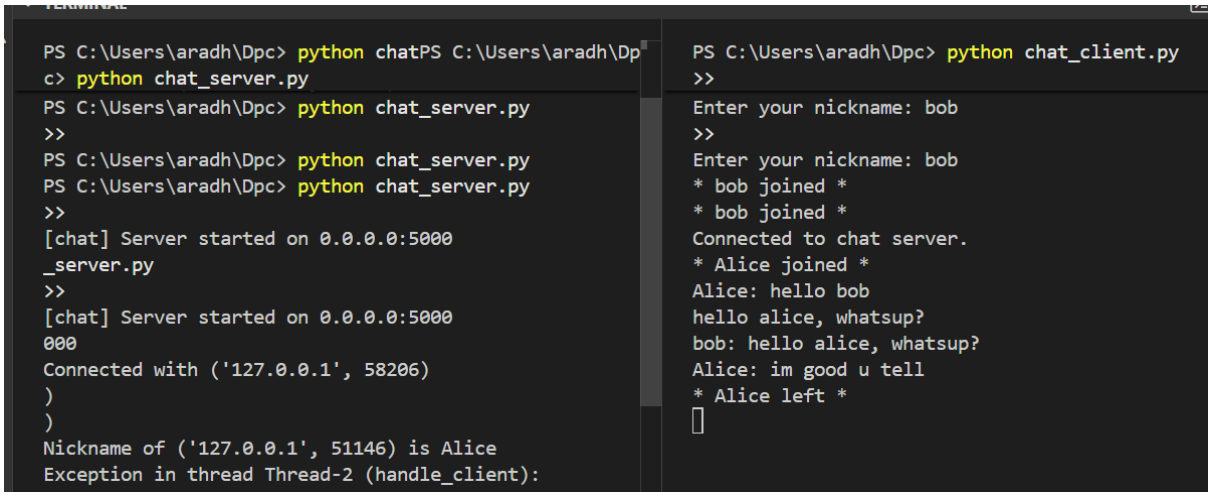
```python
import socket
import threading

# Function to receive messages from server
def receive_messages(client):
    while True:
        try:
            message = client.recv(1024).decode('utf-8')
            if message == "NICK":
                client.send(nickname.encode('utf-8'))
            else:
                print(message)
        except:
            print("Disconnected from server.")
            client.close()
            break

# Function to send messages to server
def send_messages(client):
    while True:
        message = input("")
        client.send(message.encode('utf-8'))
```

chat_client.py > ...

```python
        client.send(message.encode('utf-8'))

if __name__ == "__main__":
    host = '127.0.0.1'  # Localhost for testing
    port = 5000

    nickname = input("Enter your nickname: ")

    client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    client.connect((host, port))

    # Start threads for sending and receiving
    receive_thread = threading.Thread(target=receive_messages, args=(client,))
    receive_thread.start()

    send_thread = threading.Thread(target=send_messages, args=(client,))
    send_thread.start()
```

Output


PORTS
DEBUG CONSOLE
OUTPUT
GITLENS
PROBLEMS
TERMINAL
python
PS C:\Users\aradh\Dpc> python chat
PS C:\Users\aradh\Dpc> python chat
_server.py
PS C:\Users\aradh\Dpc> python chat
_server.py
>>
[chat] Server started on 0.0.0.0:5
000
_server.py
>>
[chat] Server started on 0.0.0.0:5
000
000
Connected with ('127.0.0.1', 58206
)
)
Nickname of ('127.0.0.1', 58206) i
s bob
Connected with ('127.0.0.1', 51146
)
Nickname of ('127.0.0.1', 51146) i
s Alice
PS C:\Users\aradh\Dpc> python chat
_client.py
>>
* Alice joined *Connected to chat
PS C:\Users\aradh\Dpc> python chat
_client.py
>>
Enter your nickname: Alice
>>
Enter your nickname: Alice
* Alice joined *Connected to chat
* Alice joined *Connected to chat
server.
hello bob
Alice: hello bob
bob: hello alice, whatsup?
im good u tell
Alice: im good u tell
PS C:\Users\aradh\Dpc> python chat
_client.py
>>
Enter your nickname: bob
PS C:\Users\aradh\Dpc> python chat
_client.py
>>
Enter your nickname: bob
>>
Enter your nickname: bob
* bob joined *
* bob joined *
Connected to chat server.
* Alice joined *
Alice: hello bob
hello alice, whatsup?
bob: hello alice, whatsup?
Alice: im good u tell


PS C:\Users\aradh\Dpc> python chatPS C:\Users\aradh\Dp
c> python chat_server.py
PS C:\Users\aradh\Dpc> python chat_server.py
>>
PS C:\Users\aradh\Dpc> python chat_server.py
PS C:\Users\aradh\Dpc> python chat_server.py
>>
[chat] Server started on 0.0.0.0:5000
_server.py
>>
[chat] Server started on 0.0.0.0:5000
000
Connected with ('127.0.0.1', 58206)
)
)
Nickname of ('127.0.0.1', 51146) is Alice
Exception in thread Thread-2 (handle_client):
PS C:\Users\aradh\Dpc> python chat_client.py
>>
Enter your nickname: bob
>>
Enter your nickname: bob
* bob joined *
* bob joined *
Connected to chat server.
* Alice joined *
Alice: hello bob
hello alice, whatsup?
bob: hello alice, whatsup?
Alice: im good u tell
* Alice left *