

MP 2

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Test Cases:

Case 1: 3 users interacting when idle

The image displays four terminal windows from a Linux environment, showing the interaction between a chat server and three clients (User#1, User#2, and User#3).

Terminal 1 (Top Left): Shows the server's startup sequence. The prompt is `matthew@matthew-VirtualBox:~`. The user runs `matthew@matthew-VirtualBox:~$./client User#1 147.0.0.1 1670`. The output indicates successful socket creation, connection to the server, and the first person joining the chat. The prompt then changes to `matthew@matthew-VirtualBox:~`.

Terminal 2 (Top Right): Shows the second client joining. The prompt is `matthew@matthew-VirtualBox:~`. The user runs `matthew@matthew-VirtualBox:~$./client User#2 147.0.0.1 1670`. The output shows successful connection and the second person joining the chat. The prompt then changes to `matthew@matthew-VirtualBox:~`.

Terminal 3 (Bottom Left): Shows the third client joining. The prompt is `matthew@matthew-VirtualBox:~`. The user runs `matthew@matthew-VirtualBox:~$./client User#3 147.0.0.1 1670`. The output shows successful connection and the third person joining the chat. The prompt then changes to `matthew@matthew-VirtualBox:~`.

Terminal 4 (Bottom Right): Shows the server's status. The prompt is `matthew@matthew-VirtualBox:~`. The user runs `matthew@matthew-VirtualBox:~$./server 147.0.0.1 1670 3`. The output shows the server is running, listening on port 1670, and has 3 clients connected. The prompt then changes to `matthew@matthew-VirtualBox:~`.

Case 2: Duplicate username rejected

```
matthew@matthew-VirtualBox: ~  
File Edit View Search Terminal Help  
matthew@matthew-VirtualBox:~$ ./client User#1 147.0.0.1 1670  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: You are the first person to join the chat!  
  
ONLINE message: User#2 had joined the chat!  
Hey Guys!  
User#2 is idle  
User#3 is idle  
You're now idle.  
User#2: My name is User#2!  
User#3: My name is User#3!  
User#2 is idle  
User#3 is idle  
OFFLINE message: User#3 had left the chat  
ONLINE message: User#3 had joined the chat  
User#3 is idle  
User#3: Hey guys I'm back as User#3!  
User#3 is idle  
OFFLINE message: User#3 had left the chat  
□  
  
matthew@matthew-VirtualBox:~$  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: User Name is already taken, try joining with a different name  
matthew@matthew-VirtualBox:~$  
  
matthew@matthew-VirtualBox: ~  
File Edit View Search Terminal Help  
matthew@matthew-VirtualBox:~$ ./client User#1 147.0.0.1 1670  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: User Name is already taken, try joining with a different name  
matthew@matthew-VirtualBox:~$  
  
matthew@matthew-VirtualBox: ~  
File Edit View Search Terminal Help  
matthew@matthew-VirtualBox:~$  
with header type 3 and attribute type 4 to FD 4  
Message Sent: User#3: Hey guys I'm back as User#3!  
with header type 3 and attribute type 4 to FD 5  
Error sending fwd message to FD 7  
Message Sent: User#3: Hey guys I'm back as User#3!  
with header type 3 and attribute type 4 to FD 7  
  
Message Send Function Called  
Message Sent: User#3 with header type 9 and attribute type 2  
Message Sent: User#3 with header type 9 and attribute type 2 to FD 4  
and attribute type 2 to FD 5  
and attribute type 2 to FD 7  
and attribute type 2  
and attribute type 2  
and attribute type 2 to FD 4  
and attribute type 2 to FD 5  
and attribute type 2 to FD 7  
User#1
```

Case 3: User leaves and comes back with the same username

```
mathew@mathew-VirtualBox: ~  
File Edit View Search Terminal Help  
mathew@mathew-VirtualBox:~$ ./client User#1 147.0.0.1 1670  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: You are the first person to join the chat!  
ONLINE message: User#2 had joined the chat!  
Hey guys!  
User#2 is idle  
User#3 is idle  
You're now idle.  
User#2: My name is User#2!  
User#3: My name is User#3!  
User#2 is idle  
User#3 is idle  
ONLINE message: User#3 had joined the chat :(  
User#3 is idle  
User#3: Hey guys, I'm back!
```

```
mathew@mathew-VirtualBox: ~  
File Edit View Search Terminal Help  
mathew@mathew-VirtualBox:~$ ./client User#2 147.0.0.1 1670  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: You have successfully joined the chat room!  
Members already in the chat are:  
User#1  
User#2  
ONLINE message: User#3 had joined the chat!  
User#1: Hey Guys!  
You're now idle.  
User#3 is idle  
User#1 is idle  
My name is User#2!  
User#3: My name is User#3!  
You're now idle.  
User#3 is idle  
ONLINE message: User#3 had left the chat :(  
User#3 is idle  
User#3: Hey guys, I'm back!
```

```
mathew@mathew-VirtualBox: ~  
File Edit View Search Terminal Help  
Client Count = 3socket accepted  
User User#3 has joined the chat room File Descriptor 6  
Username added User#3 at index 2  
Message Sent: User#3 with header type 8 and attribute type 2 to FD 4  
Message Sent: User#3 with header type 8 and attribute type 2 to FD 5  
Message Sent: User#3 with header type 8 and attribute type 2 to FD 4  
Message Sent: User#3 with header type 9 and attribute type 2 to FD 4  
Message Sent: User#3 with header type 9 and attribute type 2 to FD 5  
Message Sent: User#3 with header type 9 and attribute type 2 to FD 5  
Message Send Function Called  
Message is of type forward from user User#3  
The sender of this message is User#3 with FS 2  
Message to Send: User#3: Hey guys, I'm back!  
Message Sent: User#3: Hey guys, I'm back!  
with header type 3 and attribute type 4  
Message Sent: User#3: Hey guys, I'm back!  
with header type 3 and attribute type 4 to FD 4  
Message Sent: User#3: Hey guys, I'm back!  
with header type 3 and attribute type 4 to FD 5  
Message Send Function Called
```

```
mathew@mathew-VirtualBox: ~  
File Edit View Search Terminal Help  
mathew@mathew-VirtualBox:~$ ./client User#3 147.0.0.1 1670  
Socket is successfully created  
Client is connected to the server  
The join message has been sent successfully  
ACK message: You have successfully joined the chat room!  
Members already in the chat are:  
User#1  
User#2  
User#3  
You're now idle.  
Hey guys, I'm back!
```


Case 4: Client rejected because chatroom is full

The image shows a Kali Linux desktop environment with three terminal windows. The top-left terminal window, titled 'matthew@matthew-VirtualBox: ~', shows the server running on IP 147.0.0.1 port 1670. It displays messages from User#1, User#2, and User#3. The top-right terminal window, also titled 'matthew@matthew-VirtualBox: ~', shows a client on IP 147.0.0.1 port 1670 connecting to the server and sending messages. The bottom terminal window, titled 'matthew@matth', shows a client on IP 147.0.0.1 port 1670 connecting to the server and sending messages. The desktop background is a Kali Linux logo.

Comments:

We showed the 4 required test cases. We completed the bonus portion of the machine problem, so we should get the 20 additional points. We implemented the ACK, new client joins, the NAK, can see when a client gets rejected, ONLINE, Can see when a new clients joins, OFFLINE, can see when a user leaves, and IDLE, when a client doesn't say anything. After completing our C code, we compiled them in a linux environment and tested each required case. The above images describe what we entered in order to trigger any warnings or error messages. In the README file, there is a more comprehensive outline of our code.