

**ECEN 602: Network Programming Assignment 2**  
**TCP Simple Broadcast Chat Server and Client**  
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This document contains a list of screenshots for the Test Cases considered for normal and the bonus sequences.

- 1) TESTCASE 1:** A TCP Simple Broadcast Chat Server and Client connection. Here a maximum number of clients of 3 were allotted to be connected to the server port and the server IP. Three clients, namely abc, pqr, sri were connected to the server and are exchanging messages. The connection involves indicating the other users the list of online users, the message sent by each user, user joining the chatroom (printed at the server).

```
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats 127
.0.0.1 19000 3
Server Ready. Waiting for connections on 19000
abc has joined
pqr has joined
sri has joined
[]

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
Your username for the chat is:abc
The count is :1
ONLINE:Our newly joined member is:pqr
ONLINE:Our newly joined member is:sri
Received MESSAGE from pqr : Hi I am PQR

Received MESSAGE from sri : hi i AM SRI

COOL! I AM ABC! IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
[]

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats pqr
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is pqr
List of Online users :
:abc pqr
The count is :2
ONLINE:Our newly joined member is:sri
Hi I am PQR
Received MESSAGE from sri : hi i AM SRI

Received MESSAGE from abc : COOL! I AM ABC!

IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
[]

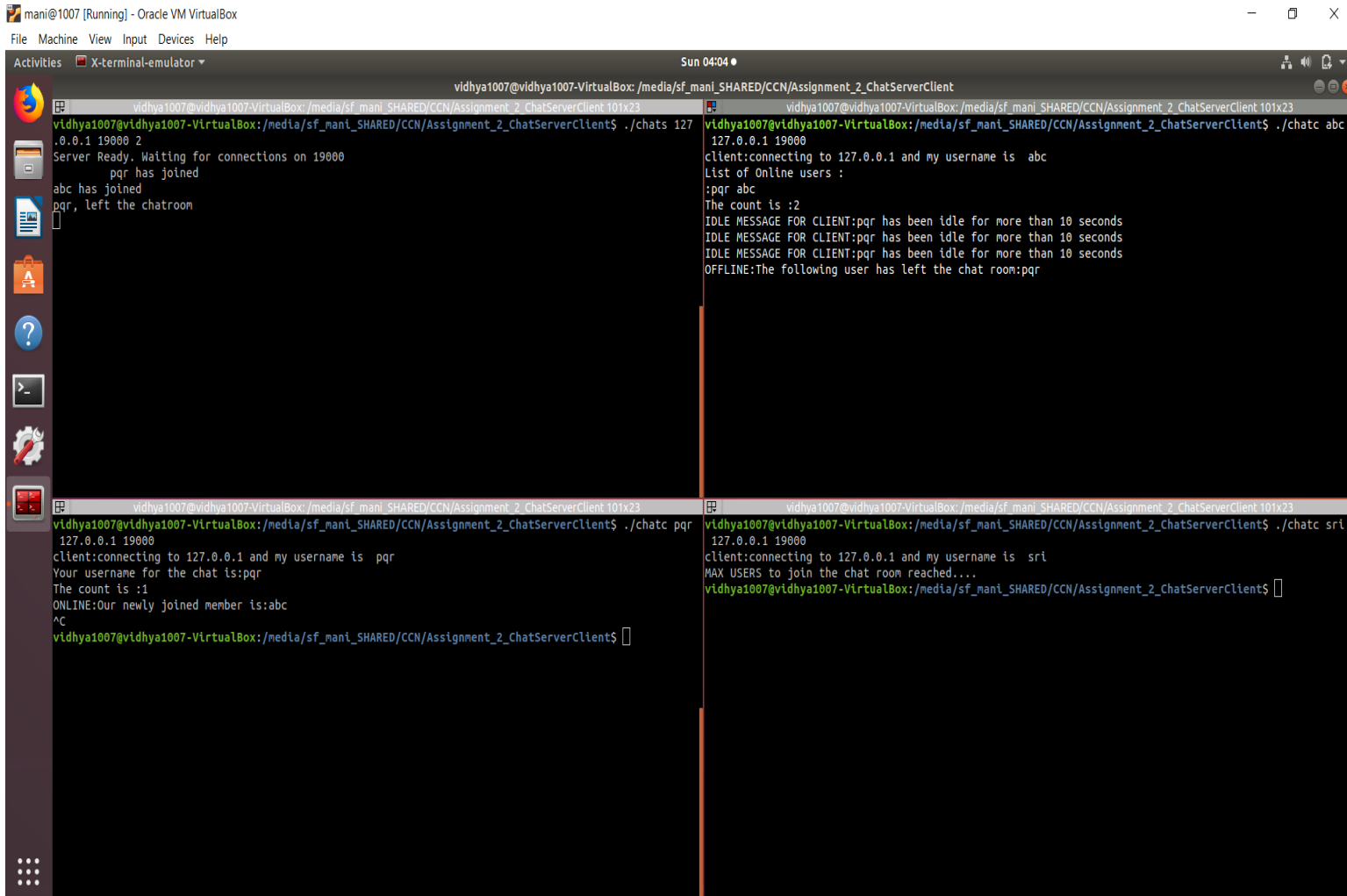
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats sri
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is sri
List of Online users :
:abc pqr sri
The count is :3
Received MESSAGE from pqr : Hi I am PQR

hi i AM SRI
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
Received MESSAGE from abc : COOL! I AM ABC!

IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
```



- 3) **TESTCASE 3:** Whenever a client leaves the chatroom, its OFFLINE status is broadcasted to other clients connected in the chat room. In the screenshot below, client : pqr leaves the chatroom, and client : abc is indicated that "OFFLINE: PQR has left the chatroom"



The screenshot shows a VirtualBox window titled "mani@1007 [Running] - Oracle VM VirtualBox" with a menu bar (File, Machine, View, Input, Devices, Help) and a toolbar. The main area contains four terminal windows running X-terminal-emulator. The top-left terminal shows the server output: "Server Ready. Waiting for connections on 19000", "pqr has joined", "abc has joined", and "pqr, left the chatroom". The top-right terminal shows client 'abc' connecting, listing online users 'pqr abc', and receiving idle messages for 'pqr' followed by an offline notification: "OFFLINE:The following user has left the chat room:pqr". The bottom-left terminal shows client 'pqr' connecting and receiving an online notification for 'abc'. The bottom-right terminal shows client 'sri' attempting to connect but being rejected because the "MAX USERS to join the chat room reached....".

```
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats 127
127.0.0.1 19000 2
Server Ready. Waiting for connections on 19000
pqr has joined
abc has joined
pqr, left the chatroom
[]

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
List of Online users :
:pqr abc
The count is :2
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
OFFLINE:The following user has left the chat room:pqr

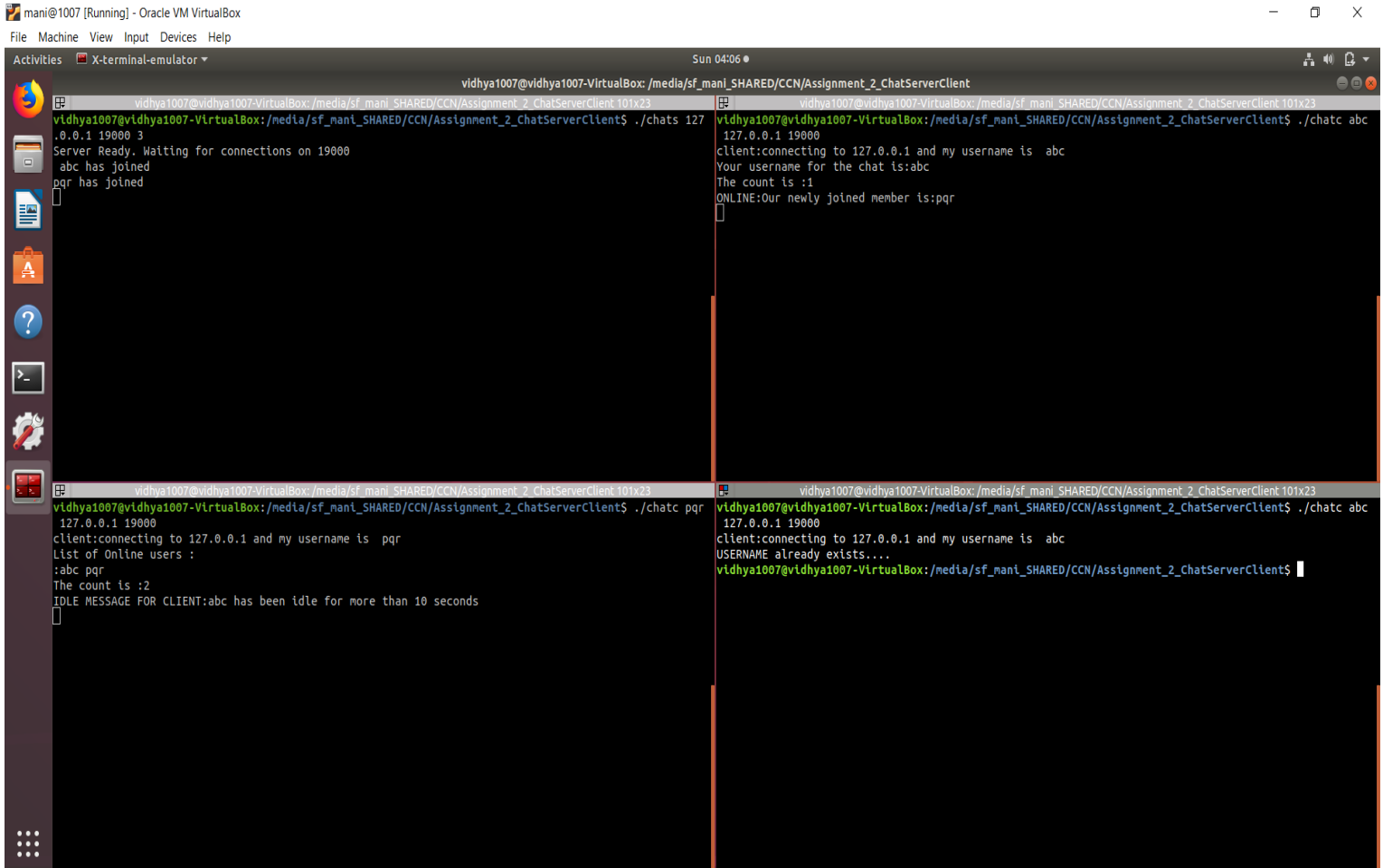
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc pqr
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is pqr
Your username for the chat is:pqr
The count is :1
ONLINE:Our newly joined member is:abc
^C
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ []

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc sri
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is sri
MAX USERS to join the chat room reached....
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ []
```

- 4) **TESTCASE 4:** This test case considered a scenario when two users try to connect with the same USERNAME. In this case a NAK is sent to the new client that is trying to JOIN the chatroom using this duplicate USERNAME. In the screenshot below, abc, pqr are in the chatroom. When a third client with the same name abc tries to join the chatroom, its request is denied with a NAK message saying, "USERNAME ALREADY EXISTS..."



The screenshot shows a VirtualBox window titled "mani@1007 [Running] - Oracle VM VirtualBox". Inside, there are four terminal windows running the "Assignment\_2\_ChatServerClient" program. The top-left terminal shows the server output: "Server Ready. Waiting for connections on 19000", "abc has joined", and "pqr has joined". The top-right terminal shows a client (abc) connecting to 127.0.0.1, receiving the username "abc", and seeing the online count as 1. The bottom-left terminal shows another client (pqr) connecting, seeing the online count as 2, and receiving an idle message for client abc. The bottom-right terminal shows a third client (abc) attempting to connect, but receiving a "USERNAME already exists...." error message.

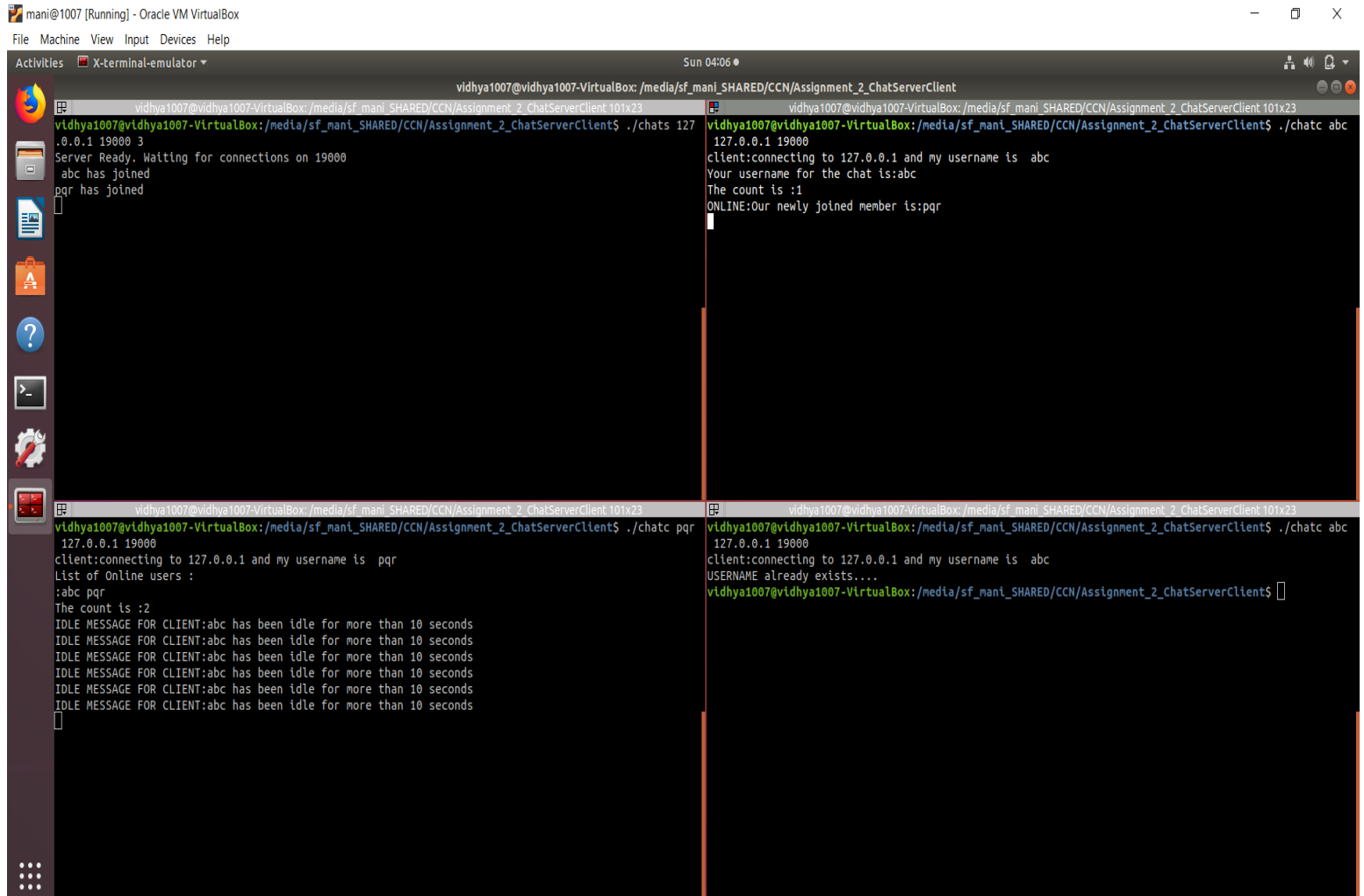
```
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats 127
127.0.0.1 19000 3
Server Ready. Waiting for connections on 19000
abc has joined
pqr has joined

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
Your username for the chat is:abc
The count is :1
ONLINE:Our newly joined member is:pqr

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc pqr
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is pqr
List of Online users :
:abc pqr
The count is :2
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
USERNAME already exists....
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$
```

**5) TESTCASE 5:** In this it is shown how the IDLE state of an inactive client is broadcasted to other users in the CHATROOM. When a client remains inactive for more than 10 seconds, an IDLE message is sent to the server, which broadcasts the username of the IDLE client to all other clients in the chatroom.



```
man1@1007 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities X-terminal-emulator Sun 04:06

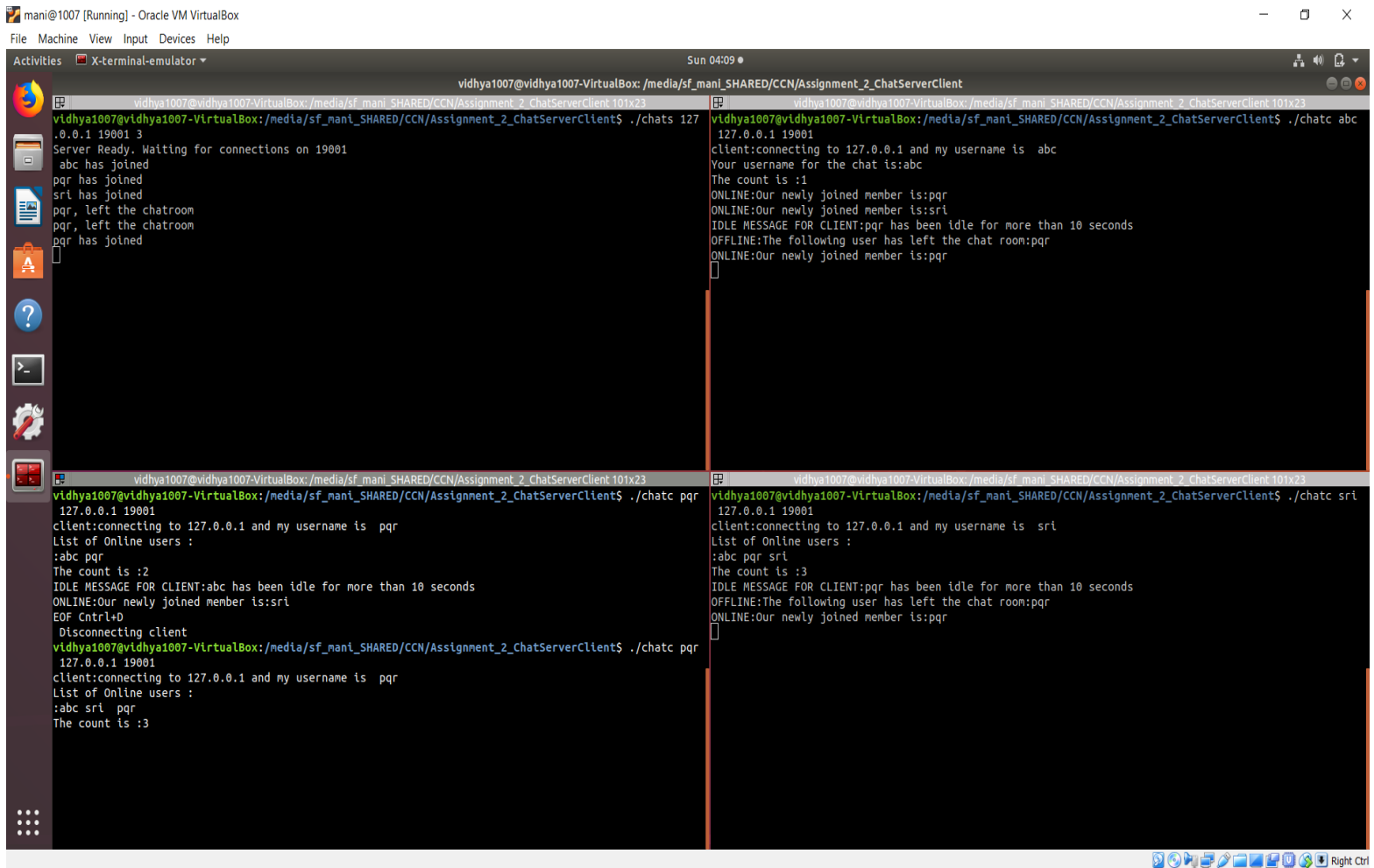
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats 127
127.0.0.1 19000 3
Server Ready. Waiting for connections on 19000
abc has joined
pqr has joined

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
Your username for the chat is:abc
The count is :1
ONLINE:Our newly joined member is:pqr

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc pqr
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is pqr
List of Online users :
:abc pqr
The count is :2
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19000
client:connecting to 127.0.0.1 and my username is abc
USERNAME already exists....
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$
```

- 6) **TESTCASE 6:** When a client exits and rejoins the chatroom with the same username, it should be able to normally connect and operate. When a client exits the chatroom, the server clears all the data corresponding to it and maintains only data pertaining to ONLINE users. Thus, when a client tries to rejoin using its previous username, it is treated as a new entity and is connected to the server. Here, pqr left the chatroom. OFFLINE status broadcasted to all the other clients in the chatroom. Then pqr joins back to the chatroom.



```
man1@1007 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chats 127
.0.0.1 19001 3
Server Ready. Waiting for connections on 19001
abc has joined
pqr has joined
sri has joined
pqr, left the chatroom
pqr, left the chatroom
pqr has joined

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc abc
127.0.0.1 19001
client:connecting to 127.0.0.1 and my username is abc
Your username for the chat is:abc
The count is :1
ONLINE:Our newly joined member is:pqr
ONLINE:Our newly joined member is:sri
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
OFFLINE:The following user has left the chat room:pqr
ONLINE:Our newly joined member is:pqr

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc pqr
127.0.0.1 19001
client:connecting to 127.0.0.1 and my username is pqr
List of Online users :
:abc pqr
The count is :2
IDLE MESSAGE FOR CLIENT:abc has been idle for more than 10 seconds
ONLINE:Our newly joined member is:sri
EOF Cntrl+D
Disconnecting client
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc pqr
127.0.0.1 19001
client:connecting to 127.0.0.1 and my username is pqr
List of Online users :
:abc sri pqr
The count is :3

vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient 101x23
vidhya1007@vidhya1007-VirtualBox: /media/sf_man1_SHARED/CCN/Assignment_2_ChatServerClient$ ./chatc sri
127.0.0.1 19001
client:connecting to 127.0.0.1 and my username is sri
List of Online users :
:abc pqr sri
The count is :3
IDLE MESSAGE FOR CLIENT:pqr has been idle for more than 10 seconds
OFFLINE:The following user has left the chat room:pqr
ONLINE:Our newly joined member is:pqr
```