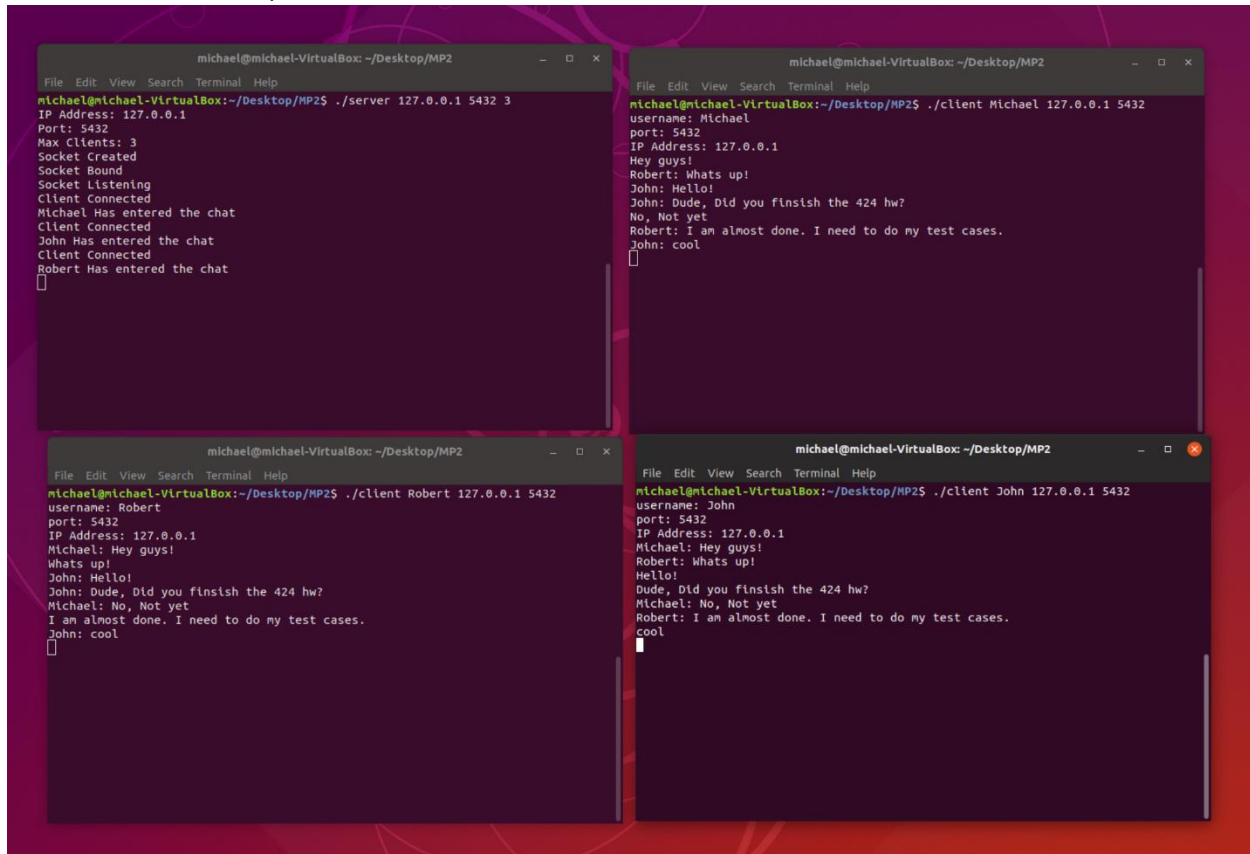


424 MP2 Report

Test Case 1: normal operation of the chat client with three clients connected



The image displays four terminal windows from a VirtualBox environment, showing the execution of a chat server and three clients. The windows are arranged in a 2x2 grid.

Top-Left Window (Server): Shows the server running on port 5432. It logs the connection of three clients: Michael, John, and Robert.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./server 127.0.0.1 5432 3
IP Address: 127.0.0.1
Port: 5432
Max Clients: 3
Socket Created
Socket Bound
Socket Listening
Client Connected
Michael Has entered the chat
Client Connected
John Has entered the chat
Client Connected
Robert Has entered the chat
█
```

Top-Right Window (Client Michael): Shows the client interface for Michael. It displays the messages received from the other clients.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
Hey guys!
Robert: Whats up!
John: Hello!
John: Dude, Did you finish the 424 hw?
No, Not yet
Robert: I am almost done. I need to do my test cases.
John: cool
█
```

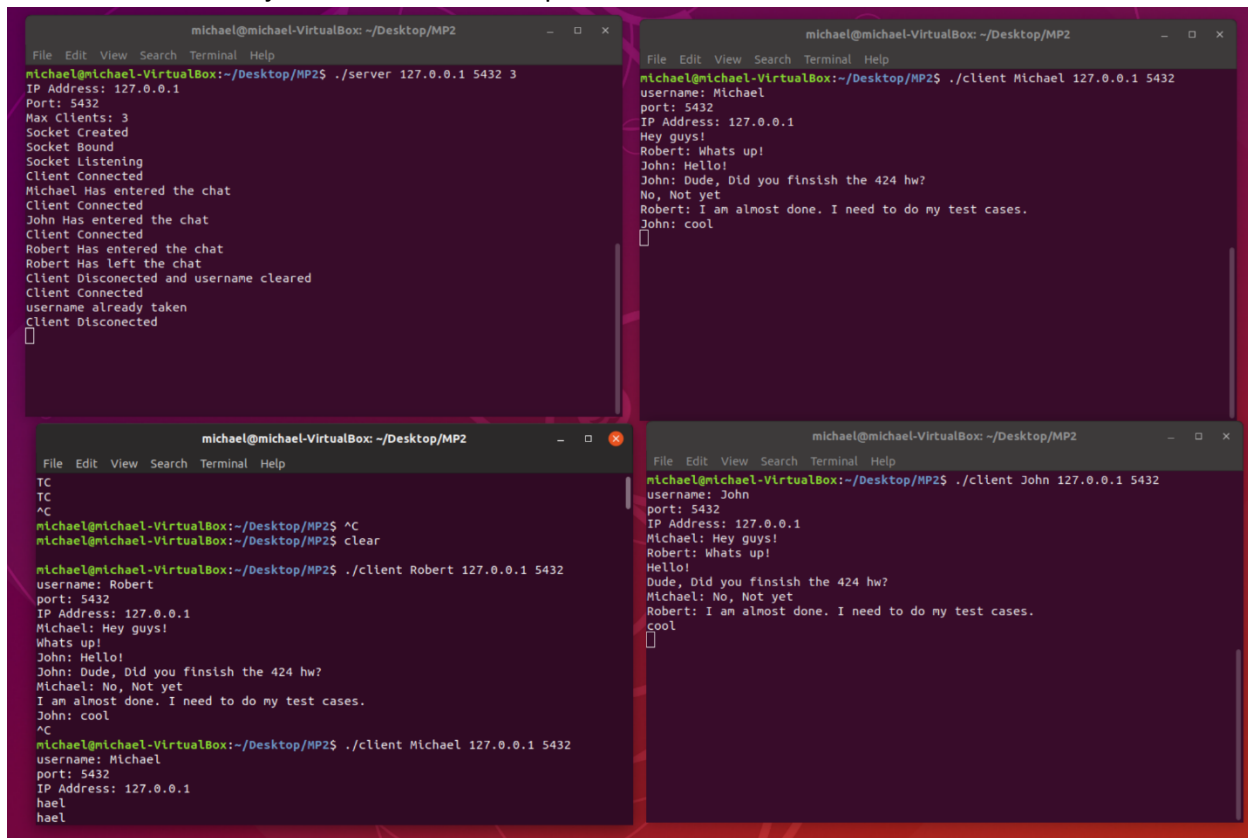
Bottom-Left Window (Client Robert): Shows the client interface for Robert. It displays the messages received from the other clients.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Robert 127.0.0.1 5432
username: Robert
port: 5432
IP Address: 127.0.0.1
Michael: Hey guys!
Whats up!
John: Hello!
John: Dude, Did you finish the 424 hw?
Michael: No, Not yet
I am almost done. I need to do my test cases.
John: cool
█
```

Bottom-Right Window (Client John): Shows the client interface for John. It displays the messages received from the other clients.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client John 127.0.0.1 5432
username: John
port: 5432
IP Address: 127.0.0.1
Michael: Hey guys!
Robert: Whats up!
Hello!
Dude, Did you finish the 424 hw?
Michael: No, Not yet
Robert: I am almost done. I need to do my test cases.
cool
█
```

Test Case 2: server rejects a client with a duplicate username



The image displays four terminal windows arranged in a 2x2 grid, showing the execution of a server and client program. The top-left window shows the server starting and accepting connections from Michael, John, and Robert. The top-right window shows Michael's client connecting and sending messages. The bottom-left window shows Robert's client connecting and sending messages, followed by Michael's client connecting again and being rejected due to a duplicate username. The bottom-right window shows John's client connecting and sending messages.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./server 127.0.0.1 5432 3
IP Address: 127.0.0.1
Port: 5432
Max Clients: 3
Socket Created
Socket Bound
Socket Listening
Client Connected
Michael Has entered the chat
Client Connected
John Has entered the chat
Client Connected
Robert Has entered the chat
Robert Has left the chat
Client Disconnected and username cleared
Client Connected
username already taken
Client Disconnected

```

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
Hey guys!
Robert: Whats up!
John: Hello!
John: Dude, Did you finish the 424 hw?
No, Not yet
Robert: I am almost done. I need to do my test cases.
John: cool

```

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
TC
TC
^C
michael@michael-VirtualBox:~/Desktop/MP2$ ^C
michael@michael-VirtualBox:~/Desktop/MP2$ clear
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Robert 127.0.0.1 5432
username: Robert
port: 5432
IP Address: 127.0.0.1
Michael: Hey guys!
Whats up!
John: Hello!
John: Dude, Did you finish the 424 hw?
Michael: No, Not yet
I am almost done. I need to do my test cases.
John: cool
^C
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
hael
hael

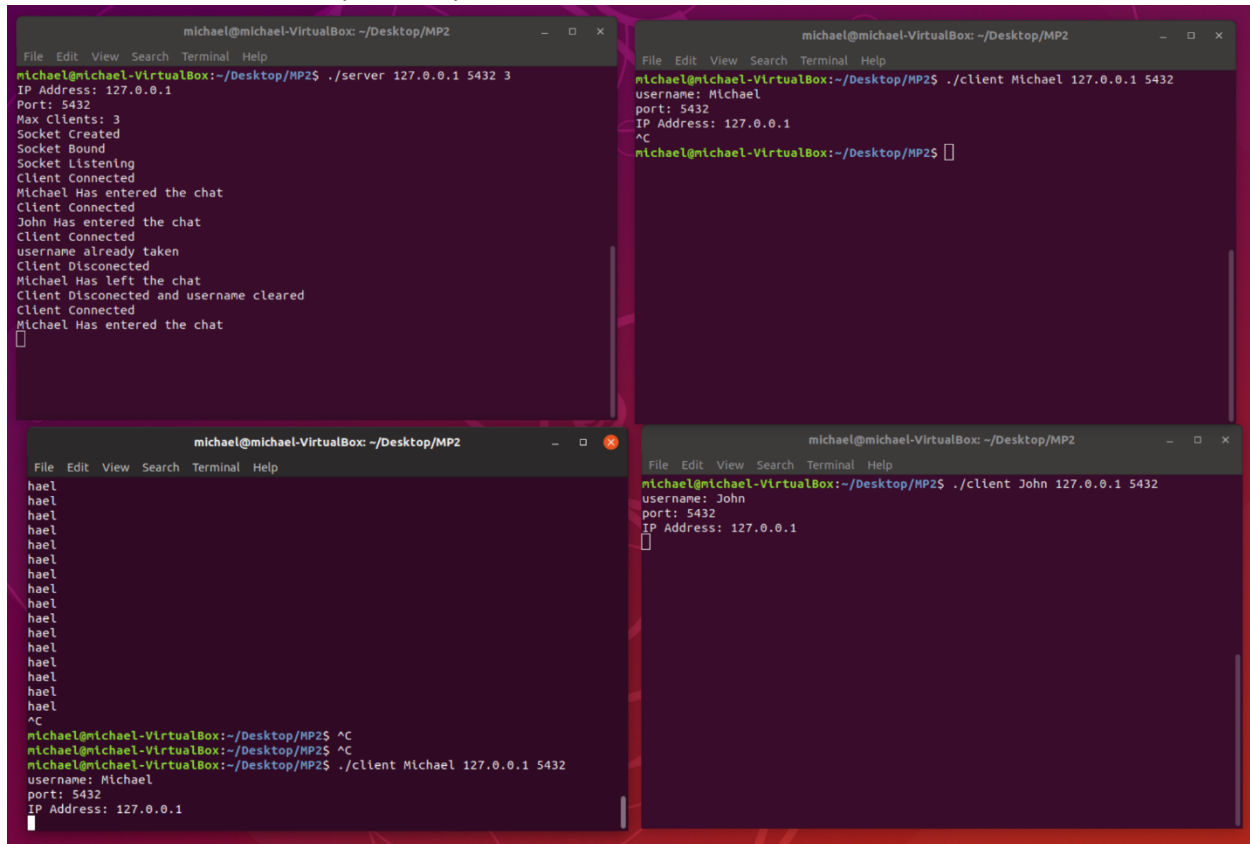
```

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client John 127.0.0.1 5432
username: John
port: 5432
IP Address: 127.0.0.1
Michael: Hey guys!
Robert: Whats up!
Hello!
Dude, Did you finish the 424 hw?
Michael: No, Not yet
Robert: I am almost done. I need to do my test cases.
cool

```

Note: If you look at the server log it detects that the username “Michael” is already taken and closes the connection to that client.

Test Case 3: Server allows a previously used username to be reused



The image displays four terminal windows from a virtual machine named 'michael@michael-VirtualBox' with the working directory set to '~/Desktop/MP2'. The top-left window shows the server being started with the command './server 127.0.0.1 5432 3'. It logs the IP address, port, and maximum clients, then shows a sequence of client connections and disconnections, including a rejection of the username 'Michael' as 'username already taken'. The top-right window shows Client 1 connecting with the command './client Michael 127.0.0.1 5432', logging their username, port, and IP address. The bottom-left window shows Client 2 attempting to connect with the same command, but the server rejects them because 'Michael' is already in use. The bottom-right window shows Client 3 connecting with the command './client John 127.0.0.1 5432', logging their username, port, and IP address. This sequence demonstrates that the server allows a previously used username to be reused after it has been cleared from the system.

```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./server 127.0.0.1 5432 3
IP Address: 127.0.0.1
Port: 5432
Max Clients: 3
Socket Created
Socket Bound
Socket Listening
Client Connected
Michael Has entered the chat
Client Connected
John Has entered the chat
Client Connected
username already taken
Client Disconnected
Michael Has left the chat
Client Disconnected and username cleared
Client Connected
Michael Has entered the chat
^C

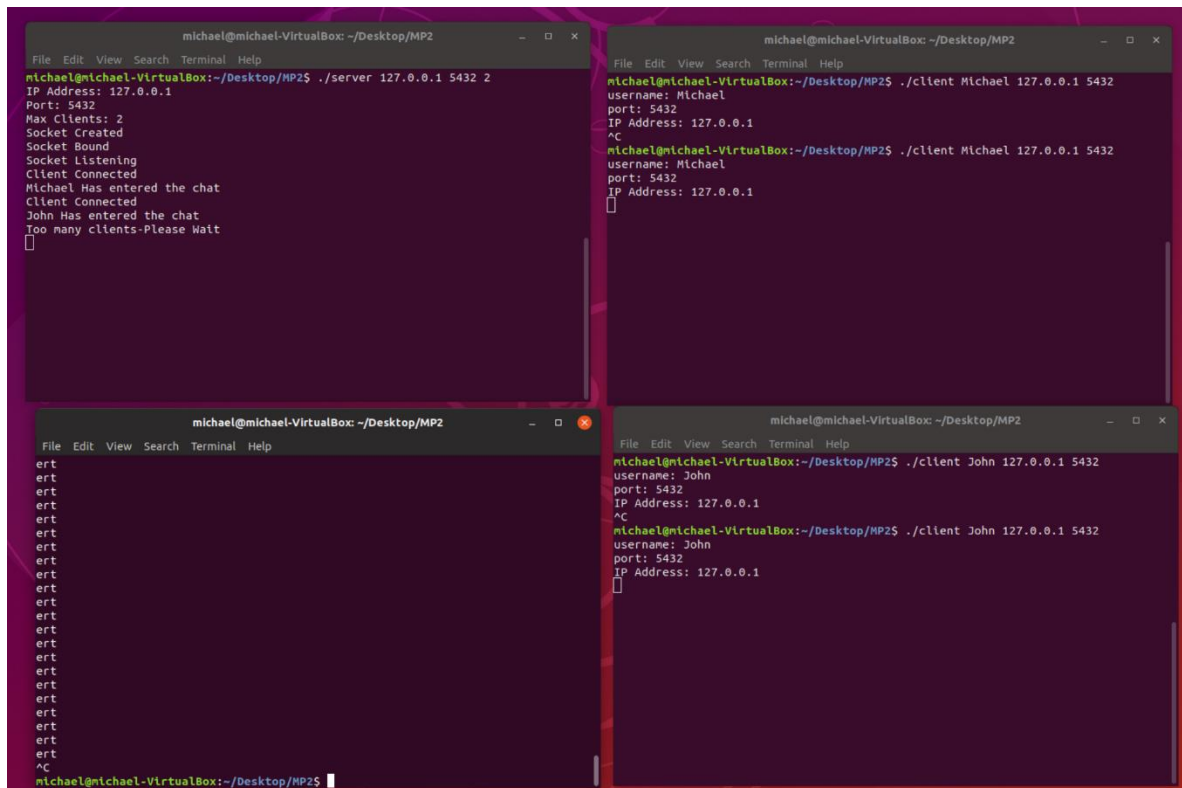
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
^C

michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
hael
^C
michael@michael-VirtualBox:~/Desktop/MP2$ ^C
michael@michael-VirtualBox:~/Desktop/MP2$ ^C
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1

michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./client John 127.0.0.1 5432
username: John
port: 5432
IP Address: 127.0.0.1
^C
```

Note: Michael (Client 1 (top right)) and John (Client 3 (bottom right)) join the server first. Client 2 (bottom left) tried to join as Michael but the server rejected him. Client 1 left the server and the user name "Michael" became available again thus letting Client 2 connect as Michael.

Test case 4: Server rejects the client because it exceeds the maximum # of clients



```
michael@michael-VirtualBox: ~/Desktop/MP2
File Edit View Search Terminal Help
michael@michael-VirtualBox:~/Desktop/MP2$ ./server 127.0.0.1 5432 2
IP Address: 127.0.0.1
Port: 5432
Max Clients: 2
Socket Created
Socket Bound
Socket Listening
Client Connected
Michael Has entered the chat
Client Connected
John Has entered the chat
Too many clients-Please Wait
^C
michael@michael-VirtualBox:~/Desktop/MP2$
```

```
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
^C
michael@michael-VirtualBox:~/Desktop/MP2$ ./client Michael 127.0.0.1 5432
username: Michael
port: 5432
IP Address: 127.0.0.1
^C
michael@michael-VirtualBox:~/Desktop/MP2$
```

```
michael@michael-VirtualBox:~/Desktop/MP2$ ./client John 127.0.0.1 5432
username: John
port: 5432
IP Address: 127.0.0.1
^C
michael@michael-VirtualBox:~/Desktop/MP2$ ./client John 127.0.0.1 5432
username: John
port: 5432
IP Address: 127.0.0.1
^C
michael@michael-VirtualBox:~/Desktop/MP2$
```

Note: The max number of clients set by the server is 2. Client 1 and Client 3 both join the server thus maxing out the number of clients on the server. When Client 2 tries to connect it is rejected since the server is already full.