

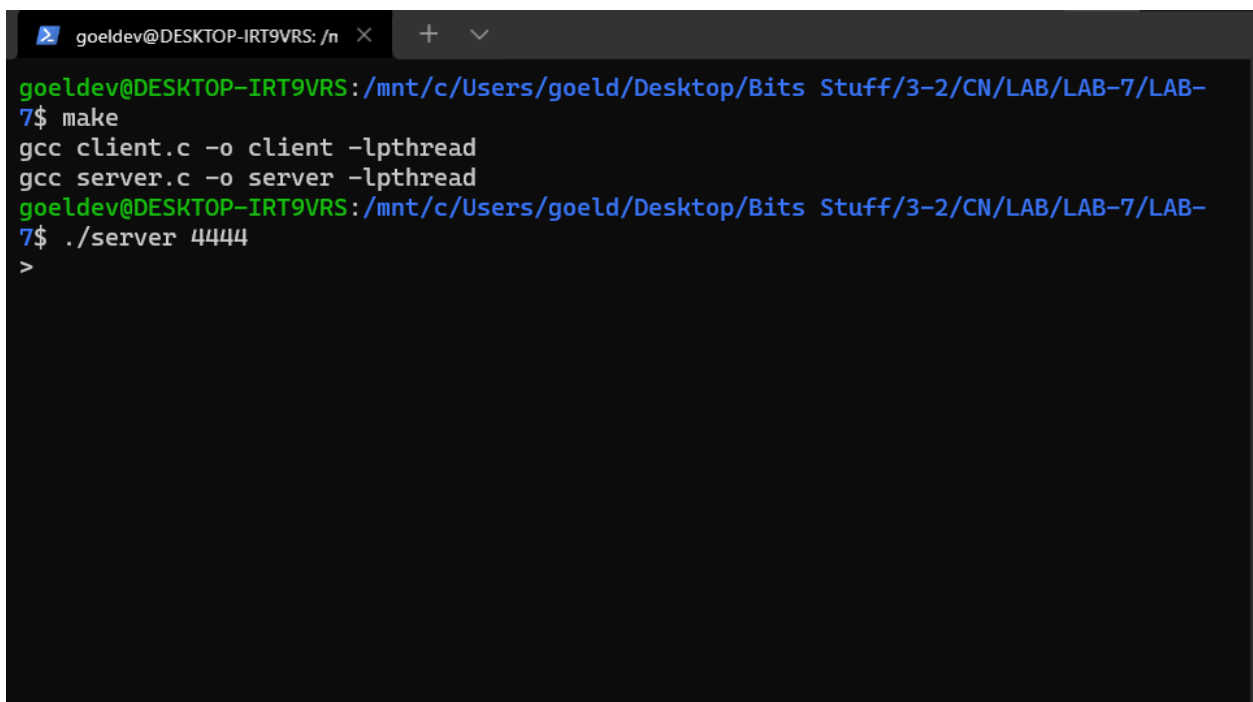
# LAB 7 - TCP Server Accepting Multiple Clients

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ID - 2019A7PS0236G

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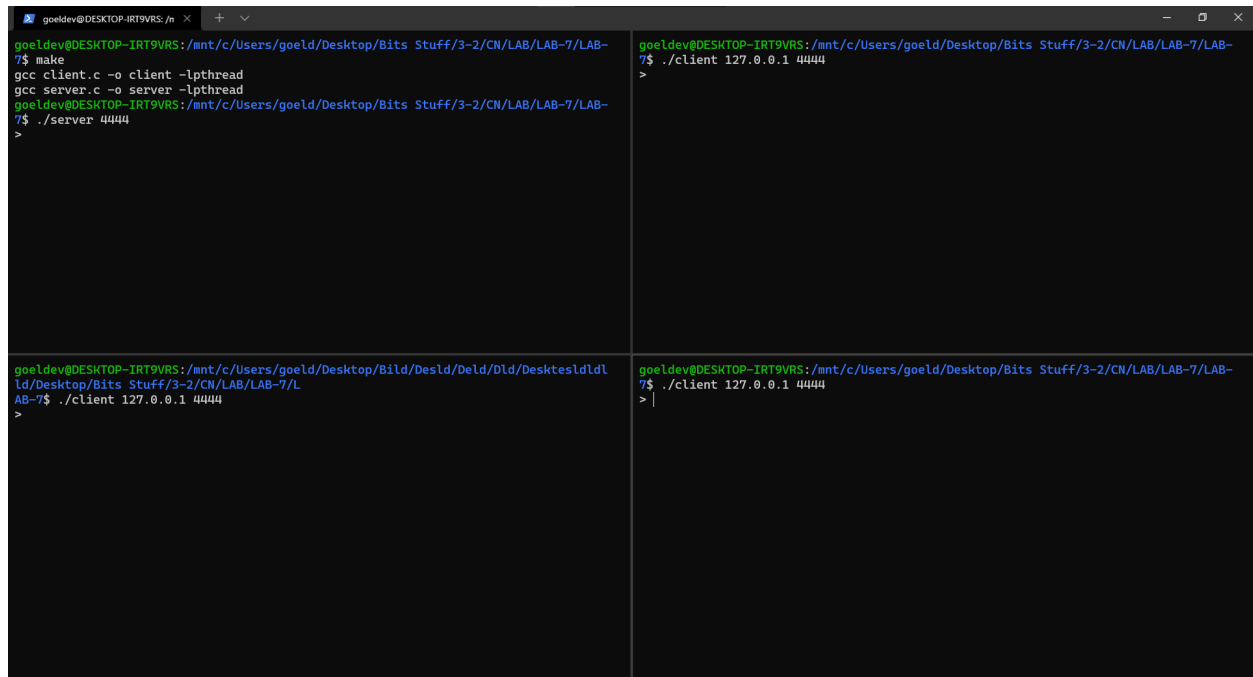
**THIS DOCUMENT DISCUSSES EACH CASE IN DETAIL RELATED TO THE CLIENT SERVER COMMUNICATION**

1. The server accepts a port number as command line argument to which it binds.

A terminal window with a dark background and light-colored text. The window title bar shows 'goeldev@DESKTOP-IRT9VRS: /n' and standard window controls. The terminal content shows the user 'goeldev@DESKTOP-IRT9VRS' at the prompt, followed by the command 'make' which compiles 'client.c' and 'server.c' into 'client' and 'server' binaries using 'gcc' and the '-lpthread' flag. Then, the user runs './server 4444' and the prompt changes to '>'.

```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ make
gcc client.c -o client -lpthread
gcc server.c -o server -lpthread
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>
```

2. The clients (here, 3) accept the IP address and port number at which it will find the server as command line arguments.

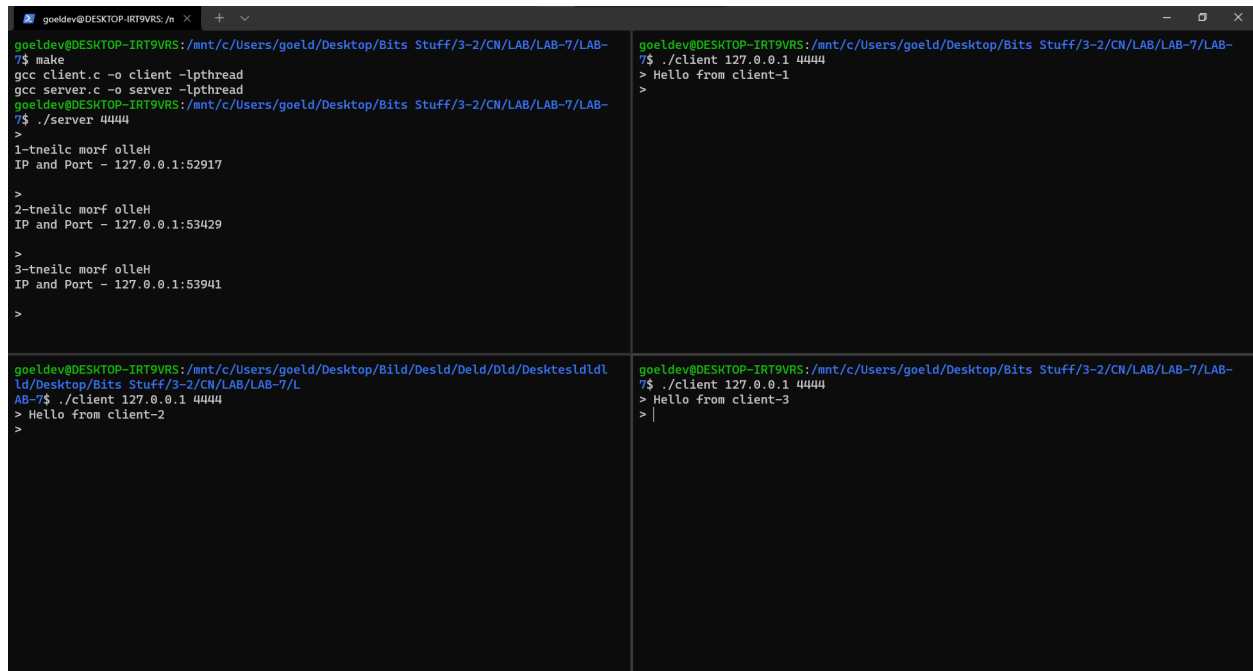


```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ make
gcc client.c -o client -lpthread
gcc server.c -o server -lpthread
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bild/Desld/Deld/Dld/Desktesldldld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> |
```

3. After connecting to the server, each client reads a line from the standard input and sends it to the server.



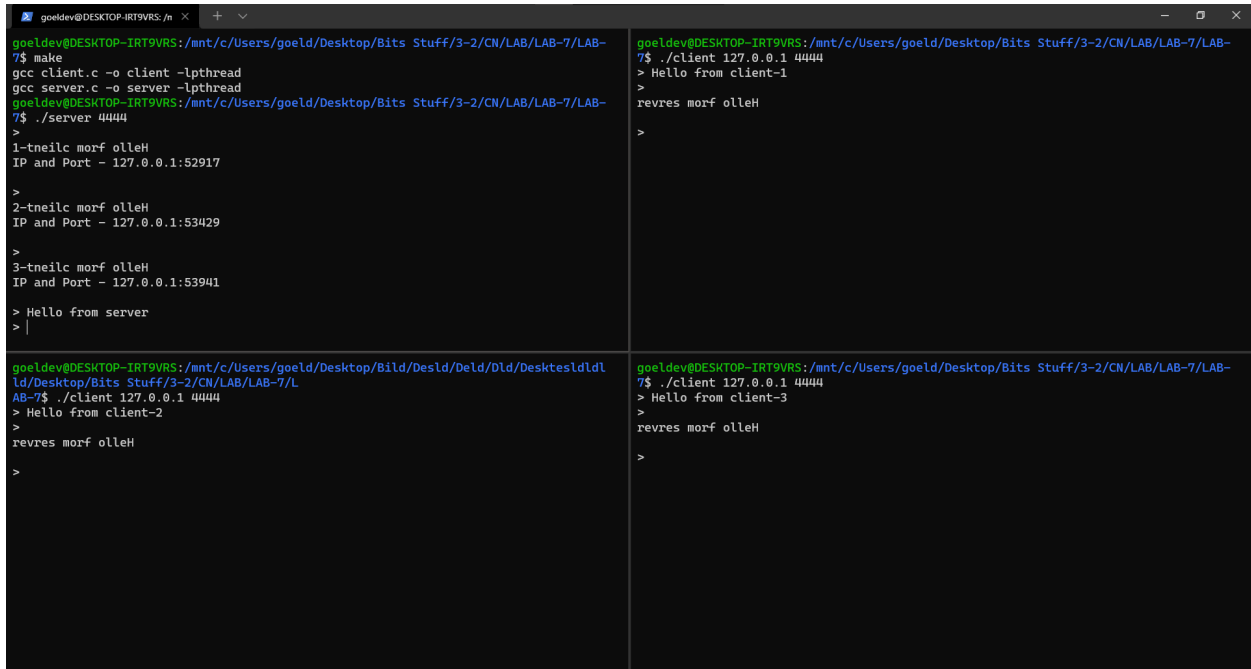
```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ make
gcc client.c -o client -lpthread
gcc server.c -o server -lpthread
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>
1-tneilc morf olleh
IP and Port - 127.0.0.1:52917
>
2-tneilc morf olleh
IP and Port - 127.0.0.1:53429
>
3-tneilc morf olleh
IP and Port - 127.0.0.1:53941
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bild/Desld/Deld/Dld/Desktesldldld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-2
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-1
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-3
> |
```

4. Server prints the received line in reversed order with the IP address and port number of the sending client. The server then reads a line from standard input and sends it to all clients. The client prints the received line in reverse order and ready to accept a new line from the user.

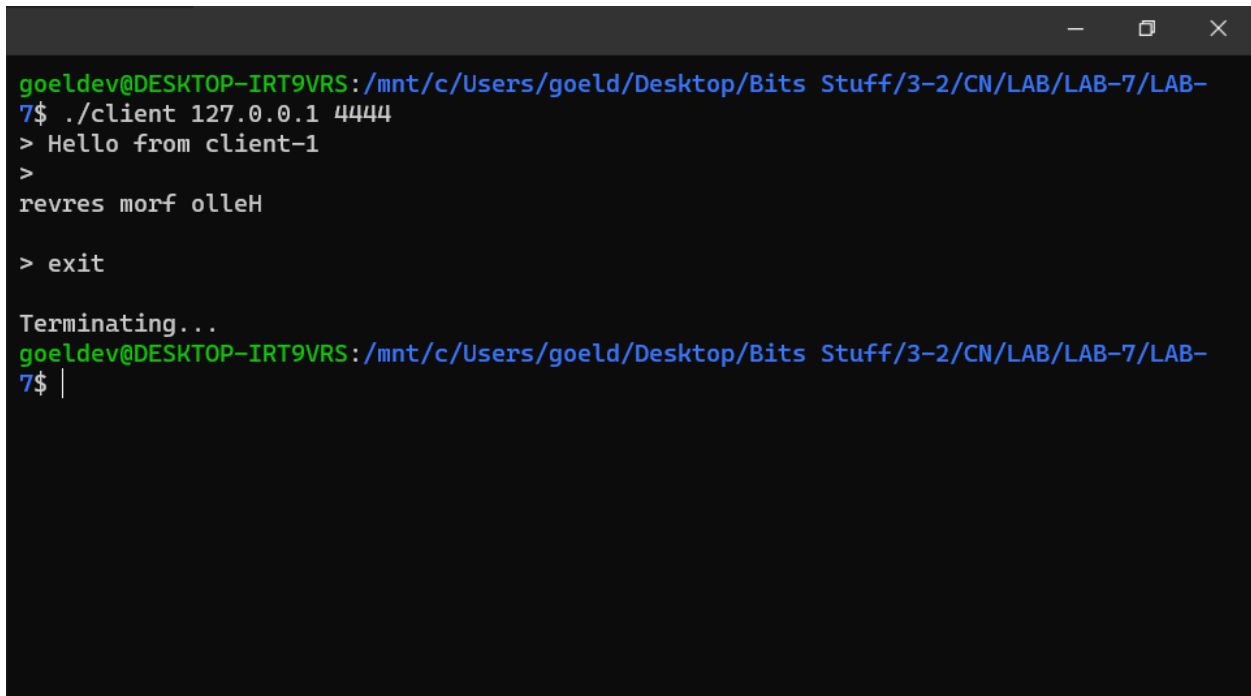


```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ make
gcc client.c -o client -lpthread
gcc server.c -o server -lpthread
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>
1-tneilc morf olleH
IP and Port - 127.0.0.1:52917
>
2-tneilc morf olleH
IP and Port - 127.0.0.1:53429
>
3-tneilc morf olleH
IP and Port - 127.0.0.1:53941
> Hello from server
> |

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bild/Desld/Deld/Dld/Desktesldldld/ld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-2
>
revres morf olleH
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-1
>
revres morf olleH
>
```

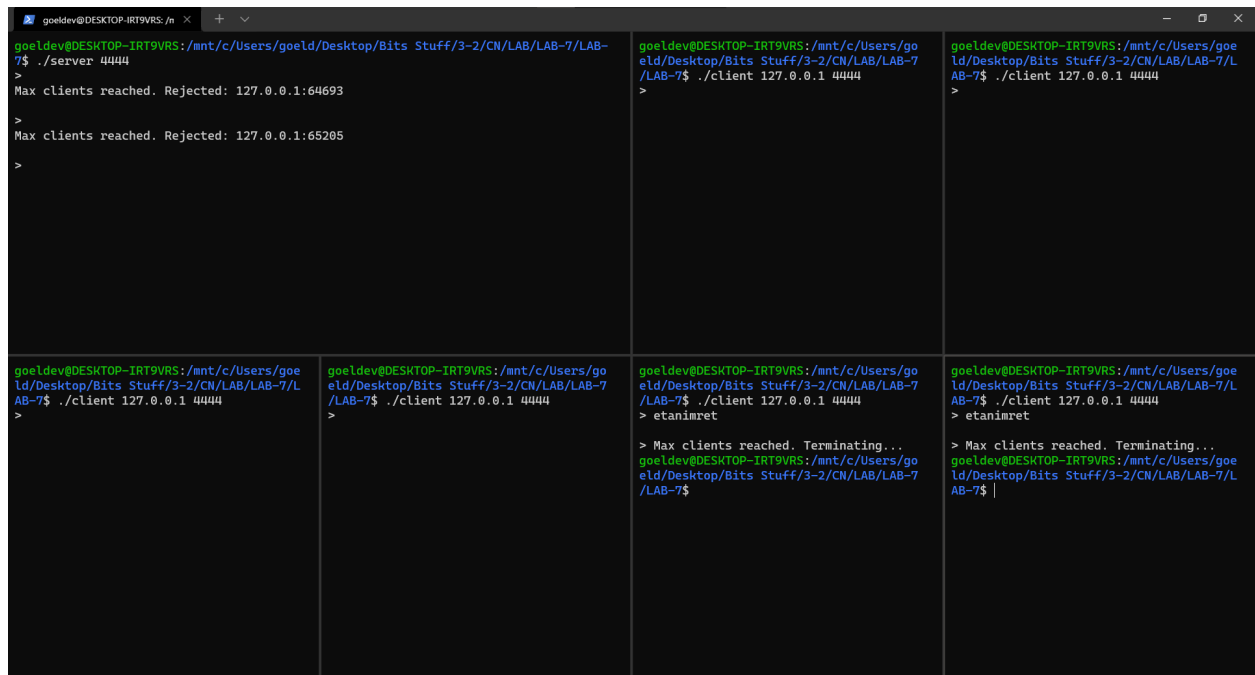
5. The client exits if the user types "exit".



```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> Hello from client-1
>
revres morf olleH
> exit

Terminating...
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ |
```

6. The server at a time accepts utmost 4 clients. The screenshot shows the 5th client terminating with a message when it connects with the server.



```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>
Max clients reached. Rejected: 127.0.0.1:64693
>
Max clients reached. Rejected: 127.0.0.1:65205
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
>

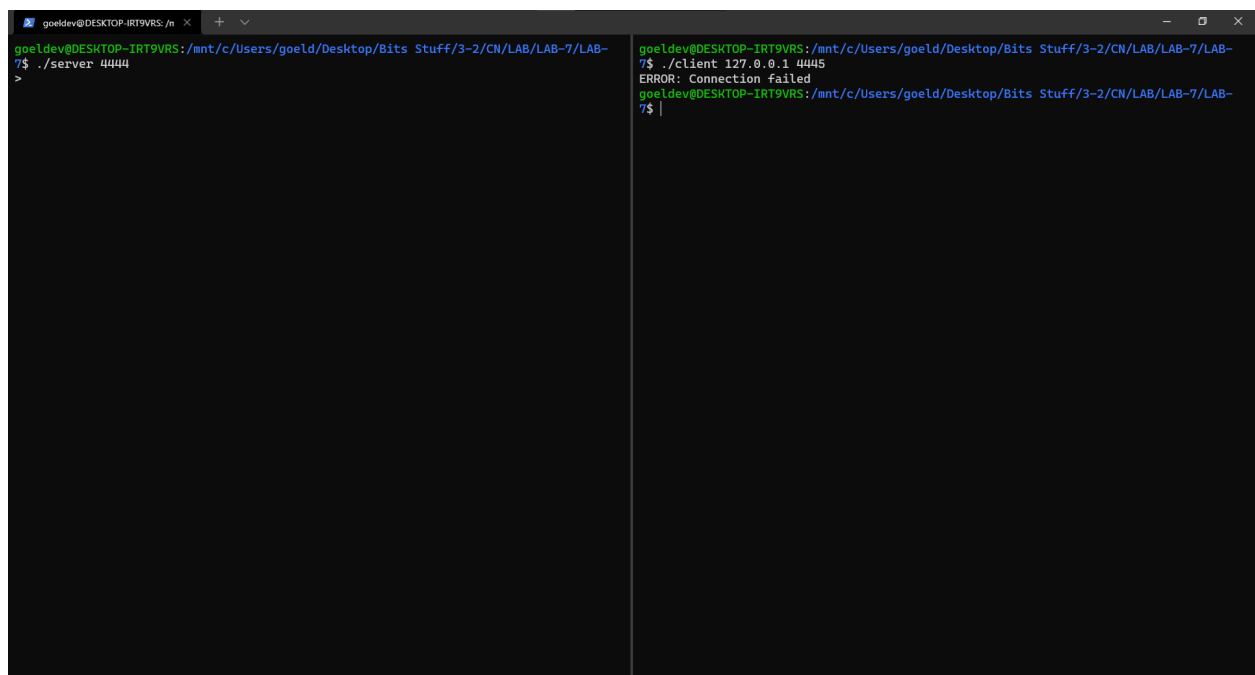
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
> etanimret

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$
> Max clients reached. Terminating...
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$
> Max clients reached. Terminating...
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ |
```

7. If we enter the wrong port in the clients, the client connection fails.



```
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./server 4444
>

goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ ./client 127.0.0.1 4444
ERROR: Connection failed
goeldev@DESKTOP-IRT9VRS: /mnt/c/Users/goeld/Desktop/Bits Stuff/3-2/CN/LAB/LAB-7/LAB-7$ |
```