



COMP 4981 – ASSIGNMENT 3

TESTING DOCUMENTATION



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Testing Documentation

Test #	Purpose	Steps	Expected Result	Actual Result
1	Able to open up the server	Open and run the server.	User is able to successfully run the server.	Passed
2	Able to open the client with proper IP and port	Open up the client and run the program, entering a good IP server and port number	User is able to run the program successfully.	Passed
3	User is able to type into the client program, entering any words	Run the client and attempt to type some letters.	User can type in the application	Passed
4	User can send data to the server	Enter any letters in the client, then press enter.	Cursor moves to the next line after pressing enter.	Passed
5	Other client can receive data from first client.	Open up two clients. Type any letters in first client, press enter, and check other client.	Words from client 1 appears on client 2's screen.	Passed
6	Test for failure: Typing in incorrect port and IP results in error	Type in incorrect IP and port when running the client.	An error appears displaying client cannot connect to server	Passed
7	Receiving client has timestamp displayed when data is sent to user.	Run two clients and the server. In client 1, send data. Check for correct data in client 2. Type in some data to send from client 2 to client 1.	Client 2 receives data from client 1 displayed with timestamp before message. Client 1 receives data with timestamp from 2.	Passed
8	Test client to client on	Open up client 1 on one computer. Open	Clients connect and run successfully,	Passed

	different computers.	another client on second computer. Run a server on any of the computers and connect to server. Send data.	displaying data sent back and forth	
9	Ensure server receives connection on client connection	Open and run the server. With server on screen, run the client.	Server displays a "Remote Address: " with the IP of the server displayed after.	Passed
10	Exiting the client results in correct message	Run the client and press ctrl-c.	Client should exit gracefully with no errors.	Passed
11	Exit the server result in correct action.	Run the server with clients connected and press ctrl-c.	Both server and clients exit gracefully with no errors, displaying server closed connection message on client.	Passed
12	Server able to handle loads of data.	Send more than 10 messages back and forth between clients.	Clients can receive data from each other with no errors or delays.	Passed
13	Client able to save chat log to a file	Specify file name as 4 th argument	File is created. File log contains all sent and received messages.	Passed
14	Select function is handling file descriptors correctly	1. User connected 2. User disconnected 3. User sent message	1. New fd added to set 2. Fd removed from set 3. Message echoed back to all users except for the sender	Passed

Testing Screenshots

Test #1

Able to open up the server

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
█
```

Test #2

Able to open the client with proper IP and port

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
█
```

Test #3

User is able to type into the client program, entering any words

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey testing! █
```

Test #4

User can send data to the server

```
connect - connection refused
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey testing!
y server running on 127.0.0.1:7777
y server running on 127.0.0.1:7777
```

Test #5

Other client can receive data from first client

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey testing!
this is a test!
█

yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Client
yiaoping@ubuntu:~$ cd Downloads/4981_Assign_3-master/
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ cd Client
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey
[127.0.0.1 2017-03-20 20:18:52]: hey
[127.0.0.1 2017-03-20 20:20:04]: hey
[127.0.0.1 2017-03-20 20:20:04]: hey
Server closed connection
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
[127.0.0.1 2017-03-20 20:31:54]: this is a test!
█
```

Test #6

Test for failure: Typing in incorrect port and IP results in error

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 168.1.1.2
Can't connect to server
connect: Connection refused
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ █
```

Test #7

Receiving client has timestamp displayed when data is sent to user.

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey testing!
this is a test!
█

yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Client
yiaoping@ubuntu:~$ cd Downloads/4981_Assign_3-master/
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ cd Client
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
hey
[127.0.0.1 2017-03-20 20:18:52]: hey
[127.0.0.1 2017-03-20 20:20:04]: hey
[127.0.0.1 2017-03-20 20:20:04]: hey
Server closed connection
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
                IP Address: 127.0.0.1
[127.0.0.1 2017-03-20 20:31:54]: this is a test!
█
```

Test #8

Test client to client on different computers.

Test #9

Ensure server receives connection on client connection

```
yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Client
IP Address: 127.0.0.2
^C
User pressed Ctrl+C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.1.2
Connected:      Server Name: 127.0.1.2
                IP Address: 127.0.1.2
^C
User pressed Ctrl+C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 168.1.1.2
Can't connect to server
connect: Connection refused
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 168.1.1.2
^C
User pressed Ctrl+C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.2 7000
Connected:      Server Name: 127.0.0.2
                IP Address: 127.0.0.2
^[[A
^C
User pressed Ctrl+C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.2 7000
Connected:      Server Name: 127.0.0.2
                IP Address: 127.0.0.2
^

yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Server
yiaoping@ubuntu:~$ cd Downloads/4981_Assign_3-master/
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ ls
client  Client  clnt  mux_svr.c  server  Server  test_clnt.c
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ cd Server
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
```

Test #10

Exiting the client results in correct message

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.2 7000
Connected:      Server Name: 127.0.0.2
                IP Address: 127.0.0.2
^C
User pressed Ctrl+C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ █
yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Server
yiaoping@ubuntu:~$ cd Downloads/4981_Assign_3-master/
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ ls
client  Client  clnt  mux_svr.c  server  Server  test_clnt.c
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master$ cd Server
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
```


Test #11

Exit the server results in correct action.

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.2
7000Connected:      Server Name: 127.0.0.2
                   IP Address: 127.0.0.2
Server closed connection
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ █

yiaoping@ubuntu: ~/Downloads/4981_Assign_3-master/Server
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
Remote Address: 127.0.0.1
Remote Address: 127.0.0.1 closed connection
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ ./server
Remote Address: 127.0.0.1
^C
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Server$ █
```

Test #12

Server able to handle loads of data.

```
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
               IP Address: 127.0.0.1
hey man
this is a test
[127.0.0.1 2017-03-20 20:38:31]: hey
[127.0.0.1 2017-03-20 20:38:33]: this is a second test
[127.0.0.1 2017-03-20 20:38:35]: i am client 2
and i am client 1
when i type, there's no timestamp
[127.0.0.1 2017-03-20 20:38:49]: but when i type, there is a timestamp along with my ip
The timestamp displays the time that the message was received
[127.0.0.1 2017-03-20 20:39:12]: I will send many messages
[127.0.0.1 2017-03-20 20:39:17]: to stress test the system
[127.0.0.1 2017-03-20 20:39:19]: and the load
and i will send back many messages
to test the load and the system
I've now reached 10 messages
[127.0.0.1 2017-03-20 20:39:35]: I have also now reached 10 messages
[127.0.0.1 2017-03-20 20:39:37]: asdf
[127.0.0.1 2017-03-20 20:39:37]: asdf
[127.0.0.1 2017-03-20 20:39:37]: asdf
[127.0.0.1 2017-03-20 20:39:37]: asdf
[127.0.0.1 2017-03-20 20:39:38]: asdf
asdf
sasdf

yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client
yiaoping@ubuntu:~/Downloads/4981_Assign_3-master/Client$ ./client 127.0.0.1
Connected:      Server Name: 127.0.0.1
               IP Address: 127.0.0.1
[127.0.0.1 2017-03-20 20:38:28]: hey man
[127.0.0.1 2017-03-20 20:38:29]: this is a test
hey
this is a second test
i am client 2
[127.0.0.1 2017-03-20 20:38:37]: and i am client 1
[127.0.0.1 2017-03-20 20:38:42]: when i type, there's no timestamp
but when i type, there is a timestamp along with my ip
[127.0.0.1 2017-03-20 20:39:02]: The timestamp displays the time that the message was received
I will send many messages
to stress test the system
and the load
[127.0.0.1 2017-03-20 20:39:24]: and i will send back many messages
[127.0.0.1 2017-03-20 20:39:27]: to test the load and the system
[127.0.0.1 2017-03-20 20:39:30]: I've now reached 10 messages
I have also now reached 10 messages
asdf
asdf
asdf
asdf
asdf
[127.0.0.1 2017-03-20 20:39:40]: asdf
[127.0.0.1 2017-03-20 20:39:40]: sadf
```

Test #13

Specify filename as 4th argument and connect

```
[megapers@localhost Client]$ ./client localhost 7000 Tim test1.txt
Connected!
Server Name: localhost
IP Address: 127.0.0.1
█
```

File is created

```
[megapers@localhost Client]$ ls
client      clientConnect.c  client.h  clientSelect.c  Makefile  test.txt
client.c    clientConnect.o  client.o  clientSelect.o  test1.txt
[megapers@localhost Client]$ █
```

Chat conversation is saved into file log

```
[Aman 2017-03-22 14:35:04]: Hello class!
[Tim 2017-03-22 14:35:13]: Hello!
[Yiaoping 2017-03-22 14:35:36]: Good morning!
[Aman 2017-03-22 14:37:01]: Time to check your Assignment 3...
[Yiaoping 2017-03-22 14:37:50]: Uh-oh! We didn't implement QT :(
[Tim 2017-03-22 14:38:10]: But we can save file logs!!!
```

Test #14

Users connected

```
select(6, [3 4 5], NULL, NULL, NULL) = 1 (in [3])
accept(3, {sa_family=AF_INET, sin_port=htons(34562), sin_addr=inet_addr("127.0.0.1")}, [16]) = 6
write(1, " Remote Address: 127.0.0.1\n", 28 Remote Address: 127.0.0.1) = 28
select(7, [3 4 5 6], NULL, NULL, NULL)
```

File descriptors of connected users

User disconnected

```
select(7, [3 4 5 6], NULL, NULL, NULL) = 1 (in [4])
recvfrom(4, "", 255, 0, NULL, NULL) = 0
write(1, " Remote Address: 127.0.0.1 closed connection\n", 46 Remote Address: 127.0.0.1 closed connection) = 46
close(4) = 0
select(7, [3 5 6], NULL, NULL, NULL)
```

Client with fd 4 closed connection to server

User sent message

```
select(7, [3 4 5 6], NULL, NULL, NULL) = 1 (in [4])
recvfrom(4, "[Tim 2017-03-22 14:56:28]: Hello...", 255, 0, NULL, NULL) = 25
sendto(5, "[Tim 2017-03-22 14:56:28]: Hello...", 255, 0, NULL, 0) = 255
sendto(6, "[Tim 2017-03-22 14:56:28]: Hello...", 255, 0, NULL, 0) = 255
select(7, [3 4 5 6], NULL, NULL, NULL)
```

Message received from client with fd 4.

Message only sent to clients with fd 5 and 6.

After sending, get back to select (monitor fd set).