



A-04 TEST REPORT

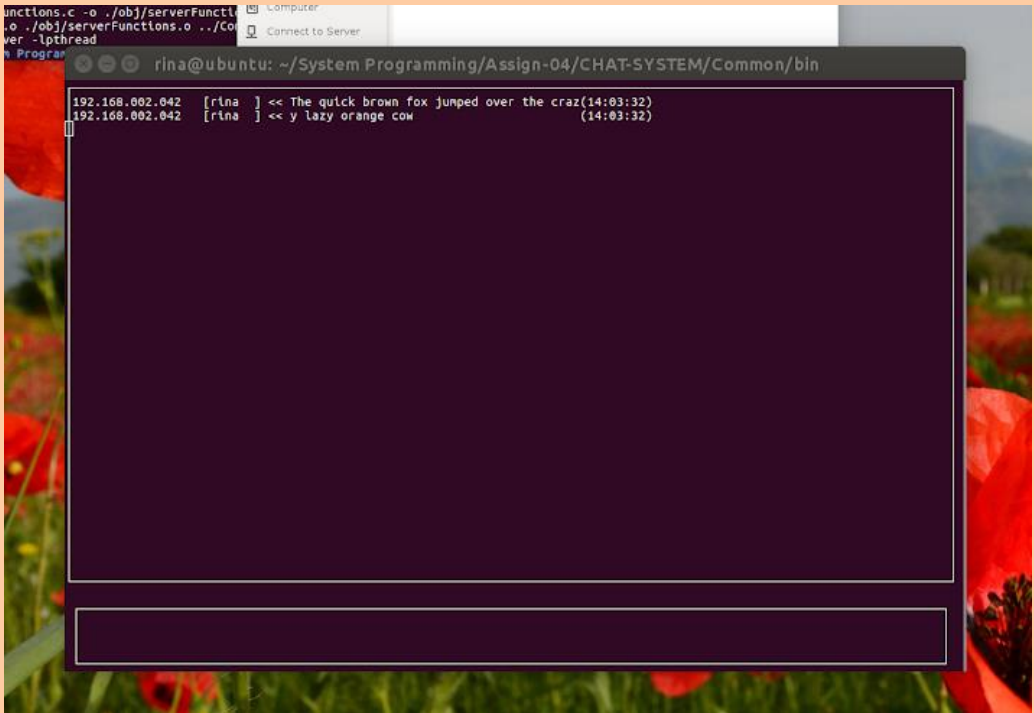
Can We Talk? Chat-System



WHO IS DOING THE TESTING?

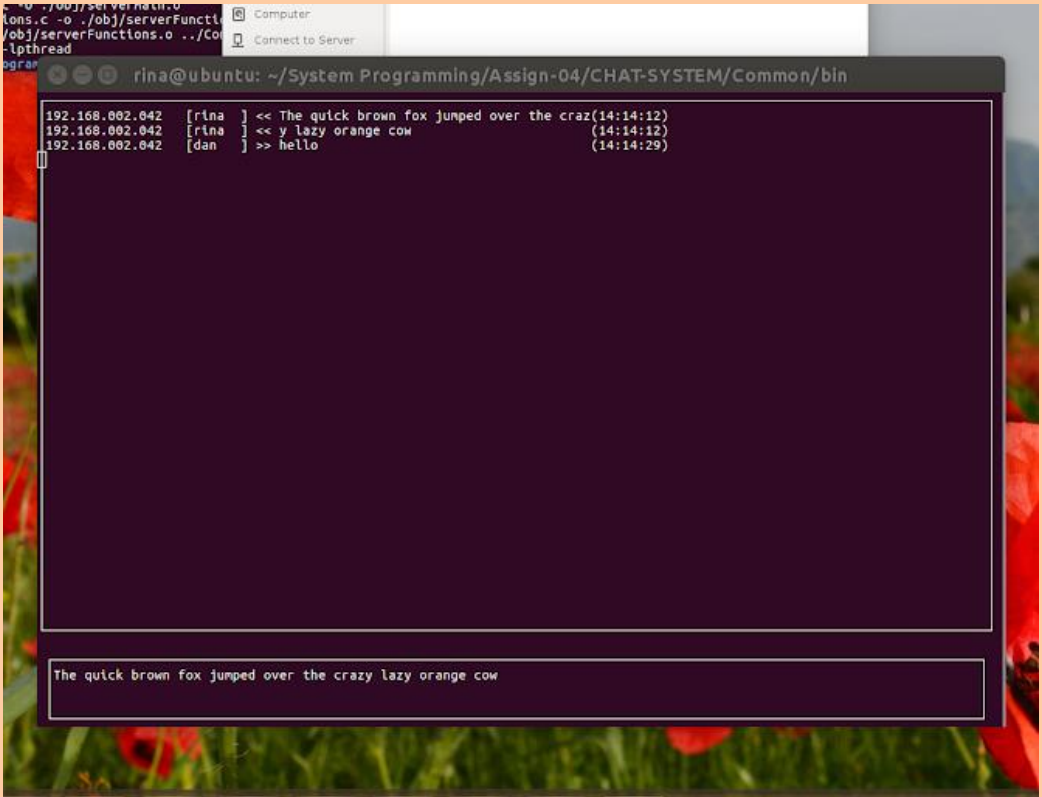
User-1 Name and Linux VM IP Address	Name: Irina Alexandru IP Address: 192.168.2.42
User-2 Name and Linux VM IP Address	Name: Daniel Baker IP Address: 192.168.60.131

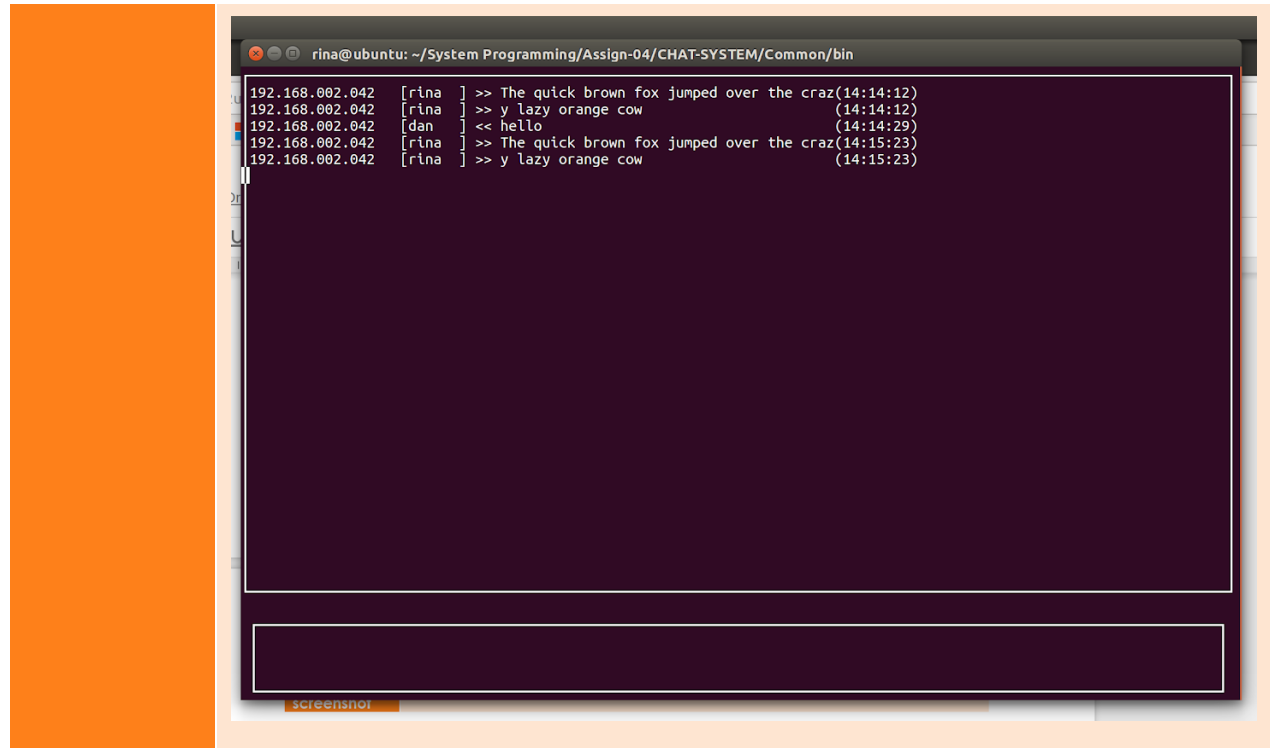
FUNCTIONAL TESTS

Test ID	FT-01
Test Type	Functional
Test purpose	In addition to testing whether or not the system supports sending messages, this test is designed to ensure that program is able to send messages that exceed the 40-character maximum. This test was also designed to see how the receiver handles a 40-character maximum, but also how the reader's buffer would handle it. This tests requirement 5 from the system requirements.
PASS/FAIL	PASS
Test results	The message was successfully broken up into a 40-character string and a 17-character string. Additionally, the second message was sent immediately after the first one, to ensure that on the receiving end, the user recognizes it was one message sent. No characters went missing or overwrote the timestamp on the sender and receiver's end. Both the reader and writers saw the same output.
User 1 screenshot - FT-01	 <p>The screenshot shows a terminal window titled 'rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin'. The terminal displays two lines of chat messages: '192.168.002.042 [rlna] << The quick brown fox jumped over the craz(14:03:32)' and '192.168.002.042 [rlna] << y lazy orange cow (14:03:32)'. The background of the terminal window shows a desktop with a red flower wallpaper.</p>

User 2
screenshot
FT-01

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [rina ] >> The quick brown fox jumped over the craz(14:03:32)
192.168.002.042 [rina ] >> y lazy orange cow (14:03:32)
```

Test ID	FT-02
Test Type	Functional
Test purpose	This tests threading & message sending. Additionally, this test was designed to ensure that if user 1 sends a message while user 2 has characters typed on the screen, but are not sent, that it wouldn't overwrite/destroy user 2's message. Therefore, this test is designed to ensure that multiple people can send messages at the same time, instead of having to speak one at a time. This tests requirement 8 in the assignment requirements document.
PASS/FAIL	PASS
Test results	User 2's message successfully sent, without damaging the unsent message of user 1.
User 1 screenshot-FT-02	
User 2 screenshot FT-02	



Test ID	FT-03
Test Type	Functional
Test purpose	This test is designed to ensure that the system supports multiple messages being sent. Therefore, it is designed to ensure that the reader and writer clear their buffer at appropriate times. If this is not correctly handled, there is a strong possibility that messages sent by each of the users may have left over characters from previous messages. This test tests requirements 3, 7, and 8 in the assignment requirements document.
PASS/FAIL	PASS
Test results	All messages sent successfully and the buffer was flushed at the correct time. Note: Gaps in time stamps caused by typos by testers.
User 1 screenshot FT-03	User 1's message 1:

```
Functions.c -o ./obj/serverFunction.o ./obj/serverFunctions.o ./Common/bin/ChatSystem -lpthread
rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] >> message-01 (14:22:05)
192.168.002.042 [rlna ] << message-01 (14:22:49)
```

User 1's message 2:

```
-lpthread
rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] >> message-01 (14:24:46)
192.168.002.042 [rlna ] << message-01 (14:25:04)
192.168.002.042 [dan ] >> message-02 (14:25:21)
192.168.002.042 [rlna ] << message-02 (14:25:55)
```

User 1's message 3:

```
./obj/serverFunctions.o ../Common/bin
-lpthread
rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin

192.168.002.042 [dan ] >> message-01 (14:24:46)
192.168.002.042 [rina ] << message-01 (14:25:04)
192.168.002.042 [dan ] >> message-02 (14:25:21)
192.168.002.042 [rina ] << message-02 (14:25:55)
192.168.002.042 [dan ] >> message-03 (14:26:11)
192.168.002.042 [rina ] << message-03 (14:26:29)
```

User 1's message 4:

```
./obj/serverFunctions.o ../Common/bin
-lpthread
rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin

192.168.002.042 [dan ] >> message-01 (14:30:18)
192.168.002.042 [rina ] << message-01 (14:30:25)
192.168.002.042 [dan ] >> message-02 (14:30:34)
192.168.002.042 [rina ] << message-02 (14:30:42)
192.168.002.042 [dan ] >> message-03 (14:30:49)
192.168.002.042 [rina ] << message-03 (14:30:58)
192.168.002.042 [dan ] >> message-04 (14:31:06)
192.168.002.042 [rina ] << message-04 (14:31:25)
```

User 1's message 5:

User 2
screenshot
FT-03

```
thread
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] >> message-01 (14:30:18)
192.168.002.042 [rina ] << message-01 (14:30:25)
192.168.002.042 [dan ] >> message-02 (14:30:34)
192.168.002.042 [rina ] << message-02 (14:30:42)
192.168.002.042 [dan ] >> message-03 (14:30:49)
192.168.002.042 [rina ] << message-03 (14:30:58)
192.168.002.042 [dan ] >> message-04 (14:31:06)
192.168.002.042 [rina ] << message-04 (14:31:25)
192.168.002.042 [dan ] >> message-05 (14:31:41)
192.168.002.042 [rina ] << message-05 (14:32:13)
```

User 2's message 1:

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] << message-01 (14:22:05)
```

User 2's message 2:


```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] << message-01 (14:22:05)
192.168.002.042 [rina ] >> message-01 (14:22:49)
192.168.002.042 [dan ] << message-02 (14:23:08)
```

User 2's message 3:

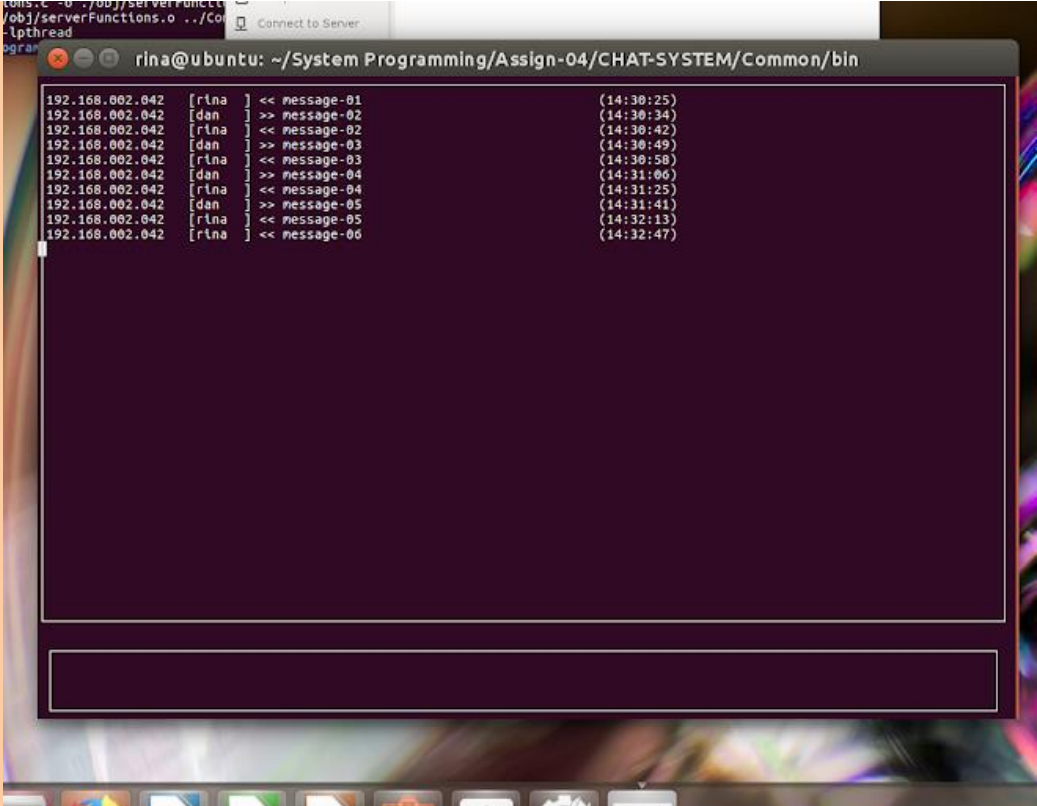
```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] << message-01 (14:24:46)
192.168.002.042 [rina ] >> message-01 (14:25:04)
192.168.002.042 [dan ] << message-02 (14:25:21)
192.168.002.042 [rina ] >> message-02 (14:25:55)
192.168.002.042 [dan ] << message-03 (14:26:11)
```

User 2's message 4:

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] << message-01 (14:30:18)
192.168.002.042 [rina ] >> message-01 (14:30:25)
192.168.002.042 [dan ] << message-02 (14:30:34)
192.168.002.042 [rina ] >> message-02 (14:30:42)
192.168.002.042 [dan ] << message-03 (14:30:49)
192.168.002.042 [rina ] >> message-03 (14:30:58)
192.168.002.042 [dan ] << message-04 (14:31:06)
```

User 2's message 5:

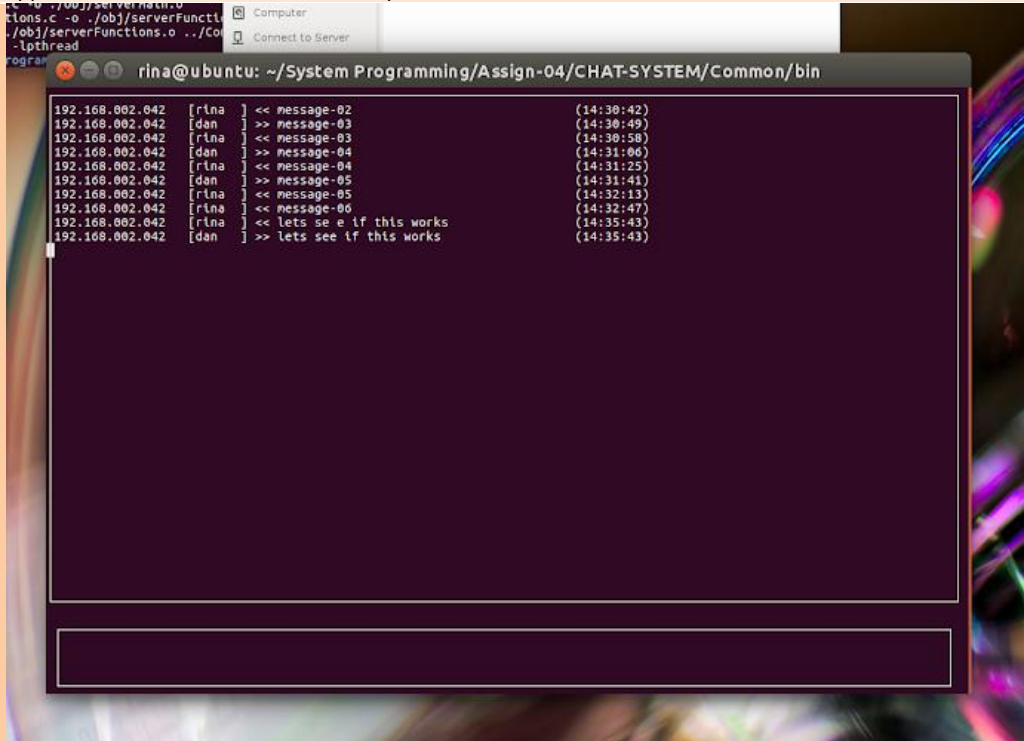
```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [dan ] << message-01 (14:30:18)
192.168.002.042 [rina ] >> message-01 (14:30:25)
192.168.002.042 [dan ] << message-02 (14:30:34)
192.168.002.042 [rina ] >> message-02 (14:30:42)
192.168.002.042 [dan ] << message-03 (14:30:49)
192.168.002.042 [rina ] >> message-03 (14:30:58)
192.168.002.042 [dan ] << message-04 (14:31:06)
192.168.002.042 [rina ] >> message-04 (14:31:25)
192.168.002.042 [dan ] << message-05 (14:31:41)
```

Test ID	FT-04
Test Type	Functional
Test purpose	This test is designed to determine how the program handles more than 10 messages on the screen as is required in the A-04 requirements. As a group, we decided to implement the scrolling mechanism provided by ncurses to handle this. This tests requirement 7 in the assignment documentation.
PASS/FAIL	PASS
Test results	The program supports scrolling. The message window scrolled. The top message from User 2 successfully scrolled offscreen.
User 1 screenshot FT-04	 <pre> 192.168.002.042 [rlna] << message-01 (14:30:25) 192.168.002.042 [dan] >> message-02 (14:30:34) 192.168.002.042 [rlna] << message-02 (14:30:42) 192.168.002.042 [dan] >> message-03 (14:30:49) 192.168.002.042 [rlna] << message-03 (14:30:58) 192.168.002.042 [dan] >> message-04 (14:31:06) 192.168.002.042 [rlna] << message-04 (14:31:25) 192.168.002.042 [dan] >> message-05 (14:31:41) 192.168.002.042 [rlna] << message-05 (14:32:13) 192.168.002.042 [rlna] << message-06 (14:32:47) </pre>

User 2
screenshot
FT-04

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [rina ] >> message-01 (14:30:25)
192.168.002.042 [dan ] << message-02 (14:30:34)
192.168.002.042 [rina ] >> message-02 (14:30:42)
192.168.002.042 [dan ] << message-03 (14:30:49)
192.168.002.042 [rina ] >> message-03 (14:30:58)
192.168.002.042 [dan ] << message-04 (14:31:06)
192.168.002.042 [rina ] >> message-04 (14:31:25)
192.168.002.042 [dan ] << message-05 (14:31:41)
192.168.002.042 [rina ] >> message-05 (14:32:13)
192.168.002.042 [rina ] >> message-06 (14:32:47)
```

BOUNDARY TESTS

Test ID	BT-01
Test Type	Boundary
Test purpose	This test is designed to ensure that the program is multithreaded and that each client is capable of sending and receiving messages at the same. This test the requirements 2 and 8 from the assignment requirements.
PASS/FAIL	PASS
Test results	<p>The multithreaded clients we able to successfully split up the CPU, thus allowing the client to send and receive messages at the same time.</p> <p>Apologies: for the typo in message at 14:35:43. Did not re-run tests, however the typo did not affect the validity of the test.</p>
User 1 screenshot BT-01	 <pre> rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin 192.168.002.042 [rlna] << message-02 (14:30:42) 192.168.002.042 [dan] >> message-03 (14:30:49) 192.168.002.042 [rlna] << message-03 (14:30:58) 192.168.002.042 [dan] >> message-04 (14:31:06) 192.168.002.042 [rlna] << message-04 (14:31:25) 192.168.002.042 [dan] >> message-05 (14:31:41) 192.168.002.042 [rlna] << message-05 (14:32:13) 192.168.002.042 [rlna] << message-06 (14:32:47) 192.168.002.042 [rlna] << lets se e if this works (14:35:43) 192.168.002.042 [dan] >> lets see if this works (14:35:43) </pre>

User 2
screenshot
BT-01

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [rina ] >> message-02 (14:30:42)
192.168.002.042 [dan ] << message-03 (14:30:49)
192.168.002.042 [rina ] >> message-03 (14:30:58)
192.168.002.042 [dan ] << message-04 (14:31:06)
192.168.002.042 [rina ] >> message-04 (14:31:25)
192.168.002.042 [dan ] << message-05 (14:31:41)
192.168.002.042 [rina ] >> message-05 (14:32:13)
192.168.002.042 [rina ] >> message-06 (14:32:47)
192.168.002.042 [rina ] >> lets se e if this works (14:35:43)
192.168.002.042 [dan ] << lets see if this works (14:35:43)
```

The quick brown fox jumped over the lazy orange cow

EXCEPTION TESTS

Test ID ET-01

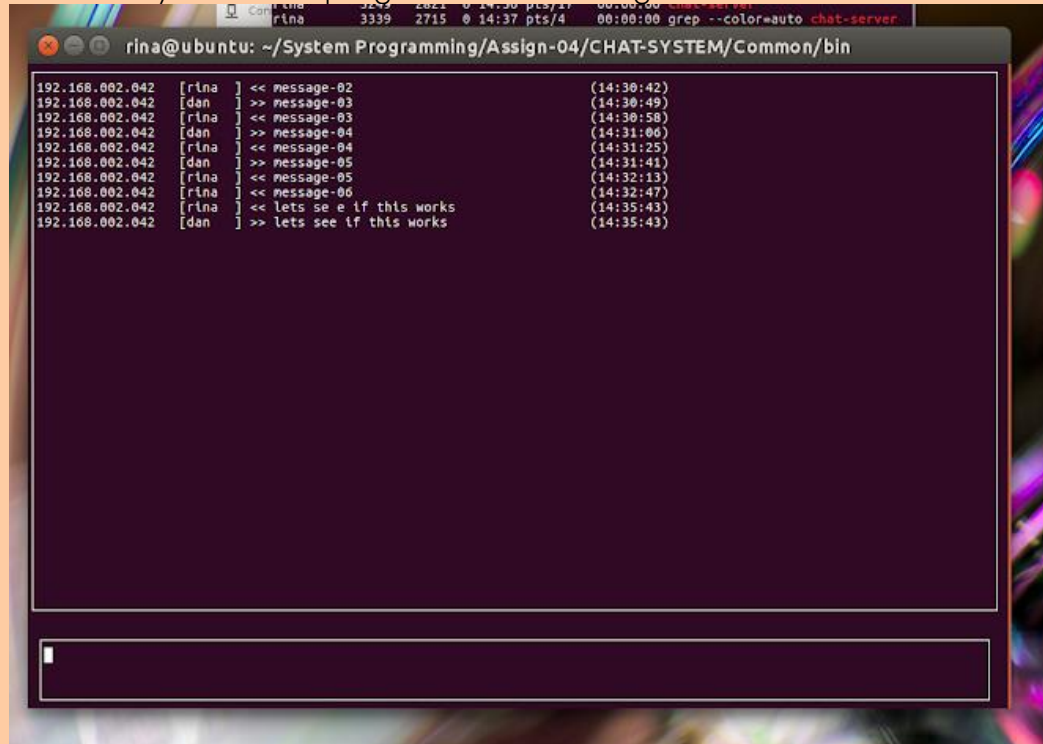
Test Type Exception

Test purpose Programs are not always shutdown safely due to factors beyond the programs control. This test is designed to ensure that as a result of the server being shutdown abruptly, the client is not left in a compromised state. Therefore, we test how the client program handles not being able to connect to a server. This test tests requirements 11 and 12 from the assignment requirements.

PASS/FAIL PASS

Test results Message was sent however it was never received. Attempting to send another message causes client disconnect safely. To ensure this, it was determined that if the buffer of what we read in from the socket repeatedly zero five times, something unexpected occurred, since a user's message can never be zero characters in length. Ten seconds after these screen captures were taken, both clients shut down gracefully.

User 1 screenshot ET-01 Immediately after attempting to send the message:



```

rlna@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [rlna ] << message-02 (14:30:42)
192.168.002.042 [dan ] >> message-03 (14:30:49)
192.168.002.042 [rlna ] << message-03 (14:30:58)
192.168.002.042 [dan ] >> message-04 (14:31:06)
192.168.002.042 [rlna ] << message-04 (14:31:25)
192.168.002.042 [dan ] >> message-05 (14:31:41)
192.168.002.042 [rlna ] << message-05 (14:32:13)
192.168.002.042 [rlna ] << message-06 (14:32:47)
192.168.002.042 [rlna ] << lets se e if this works (14:35:43)
192.168.002.042 [dan ] >> lets see if this works (14:35:43)
  
```

After shut down occurred:

```

rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client Irina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ kjn
No command 'kjn' found, did you mean:
Command 'kjs' from package 'kdelibs-bin' (universe)
Command 'ken' from package 'filters' (universe)
Command 'kon' from package 'kon2' (universe)
kjnl Command not found
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client Irina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client rina 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$

```

User 2
screenshot
ET-01

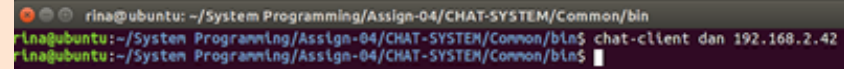
Immediately after attempting to send the message, before shut down:

```

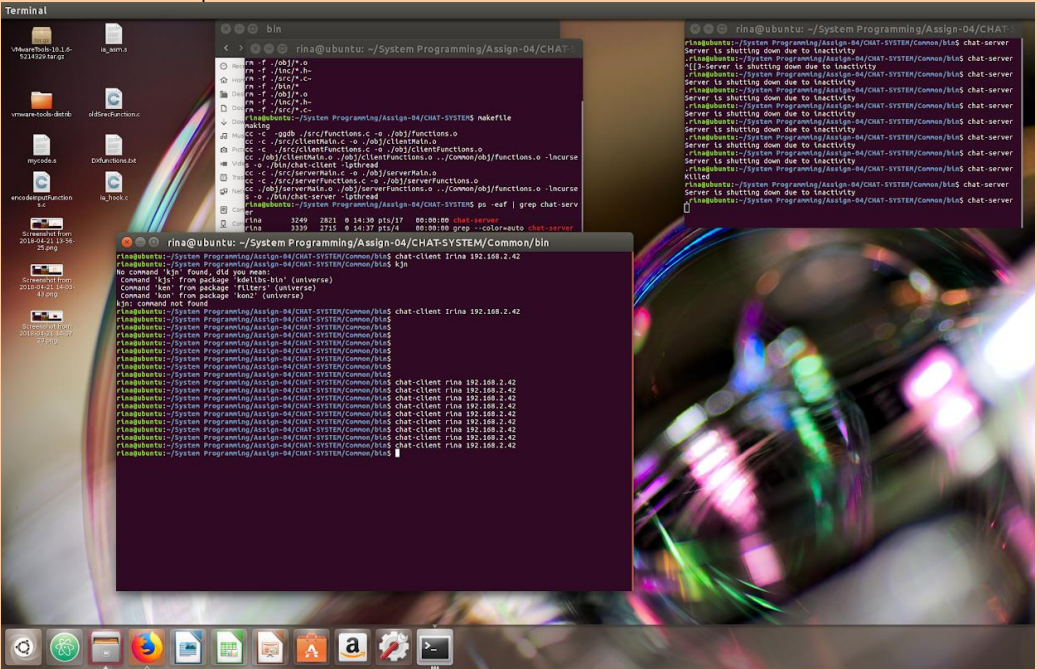
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
192.168.002.042 [rina ] >> message-02 (14:30:42)
192.168.002.042 [dan ] << message-03 (14:30:49)
192.168.002.042 [rina ] >> message-03 (14:30:58)
192.168.002.042 [dan ] << message-04 (14:31:06)
192.168.002.042 [rina ] >> message-04 (14:31:25)
192.168.002.042 [dan ] << message-05 (14:31:41)
192.168.002.042 [rina ] >> message-05 (14:32:13)
192.168.002.042 [rina ] >> message-06 (14:32:47)
192.168.002.042 [rina ] >> lets se e if this works (14:35:43)
192.168.002.042 [dan ] << lets see if this works (14:35:43)


```

After program exits:

A terminal window with a dark purple background and a light orange title bar. The title bar contains three window control icons and the text 'rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin'. The terminal shows two lines of text: the first line is a command prompt followed by the command 'chat-client dan 192.168.2.42', and the second line is a command prompt followed by a blank line and a cursor.

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client dan 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
```

Test ID	ET-02
Test Type	Exception
Test purpose	<p>Since this is a multithreaded program, it is important that not just one thread safely exits, all threads have to safely exit. This test ensures that the threads safely exit. To test this the user will send >>bye<<, which should safely end the program.</p> <p>Also, this test ensures that one client leaving the server does not result in all clients being disconnected from the server.</p> <p>This tests requirement 11 from the assignment requirements.</p>
PASS/FAIL	PASS
Test results	<p>When one client leaves, the other is still operational. One client does not mistakenly read the >>bye<< message of the other client and think it should shutdown.</p> <p>Additionally, the reading and writing threads in the client program both safely exit.</p> <p>Server shut downs correctly and client two shut down correctly.</p> <p>Note: Did not employ delay in window after client quits. Immediate shut down occurs.</p>
User 1 screenshot ET-02	<p>After user one quit:</p>  <p>After both quit, and server shut down (30 second delay):</p>



The screenshot shows a terminal window with a dark background. The title bar at the top reads "rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin". The terminal content shows a prompt "192.168.002.042 [rina] >> >>bye<<" followed by a timestamp "(14:41:50)". The terminal is mostly empty, with a few small white artifacts visible.

After user 2 quit:

```
rina@ubuntu: ~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client dan 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$ chat-client dan 192.168.2.42
rina@ubuntu:~/System Programming/Assign-04/CHAT-SYSTEM/Common/bin$
```