

Name: Alexander McKenzie

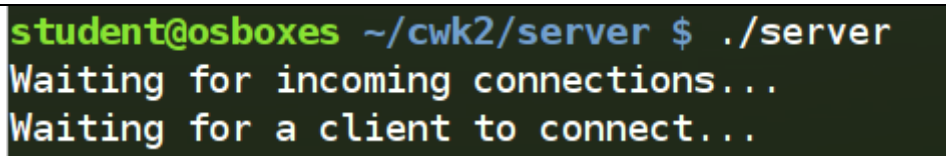
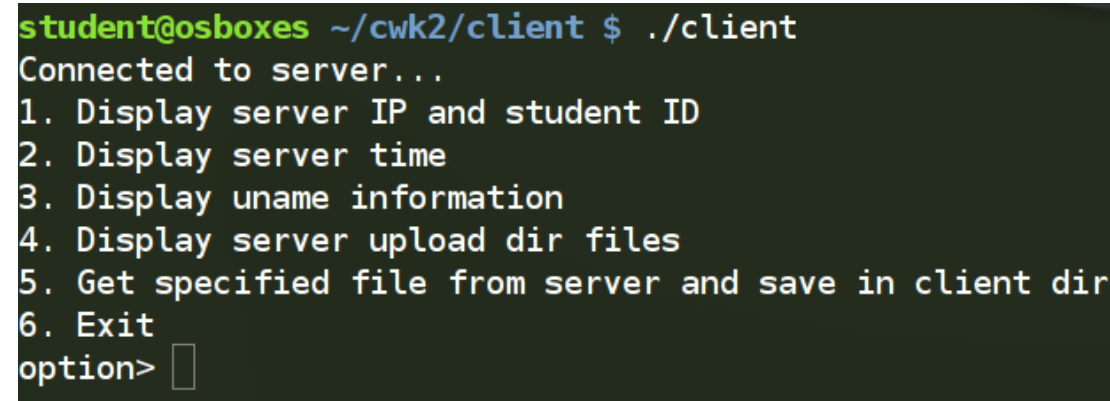
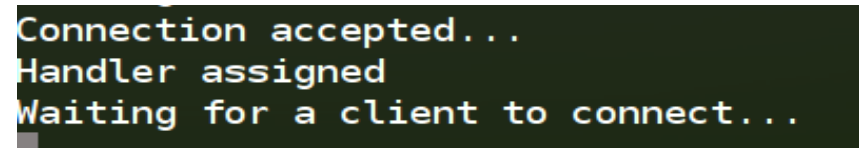
Student ID: S1507940

Testing types

- Normal = test inputs well within the programs expected range of input values
- Extreme = test inputs at the boundaries of the programs expected range of input values
- Exceptional = test inputs outwith the boundaries of the programs expected range of input values

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| Test | Testing type | Expected result | Actual result | Screenshot |
|----------------|--------------|---|---|--|
| Server startup | Normal | The server should start up as expected | The server starts up as expected |  <pre>student@osboxes ~/cwk2/server \$./server Waiting for incoming connections... Waiting for a client to connect...</pre> |
| Client startup | Normal | The client should start up and be handled by the server | The client starts up and is handled as expected |  <pre>student@osboxes ~/cwk2/client \$./client Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> </pre>  <pre>Connection accepted... Handler assigned Waiting for a client to connect...</pre> |

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| Multiple client connections | Normal | The server should handle multiple client connections at once | The server handles multiple client connections at once | <div><div><div>Terminal</div><div>File Edit View Terminal Tabs Help</div><div>student@osboxes ~/cwk2/client \$./client</div><div>Connected to server...</div><div>1. Display server IP and student ID</div><div>2. Display server time</div><div>3. Display uname information</div><div>4. Display server upload dir files</div><div>5. Get specified file from server and save in client dir</div><div>6. Exit</div><div>option> </div></div><div><div>Terminal</div><div>File Edit View Terminal Tabs Help</div><div>student@osboxes ~/cwk2/client \$./client</div><div>Connected to server...</div><div>1. Display server IP and student ID</div><div>2. Display server time</div><div>3. Display uname information</div><div>4. Display server upload dir files</div><div>5. Get specified file from server and save in client dir</div><div>6. Exit</div><div>option> </div></div></div> <div><div><div>Terminal</div><div>File Edit View Terminal Tabs Help</div><div>student@osboxes ~/cwk2/client \$./client</div><div>Connected to server...</div><div>1. Display server IP and student ID</div><div>2. Display server time</div><div>3. Display uname information</div><div>4. Display server upload dir files</div><div>5. Get specified file from server and save in client dir</div><div>6. Exit</div><div>option> </div></div><div><div>Terminal</div><div>File Edit View Terminal Tabs Help</div><div>student@osboxes ~/cwk2/server \$./server</div><div>Waiting for incoming connections...</div><div>Waiting for a client to connect...</div><div>Connection accepted...</div><div>Handler assigned</div><div>Waiting for a client to connect...</div><div>Connection accepted...</div><div>Handler assigned</div><div>Waiting for a client to connect...</div><div>Connection accepted...</div><div>Handler assigned</div><div>Waiting for a client to connect...</div><div></div></div></div> |
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| Display server IP and student ID | Extreme | The server should send the server IP and student ID strings over, the client should then output these strings | The server sends the server IP and student ID string over, the client then outputs these values | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 1 IP: 192.168.44.129 Student ID: S1507940</pre> |
| Display server time information | Normal | The server should send the server time and date information as a string to the client. The client should then output this information. | The server sends the server time and date information as a string to the client, the client then outputs this information. | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 2 Sun Dec 10 14:07:52 2017</pre> |
| Display server uname information | Normal | The server should send the utsname struct information over to the client, the client should then print out this uts information | The server send the utsname struct information over to the client, the client then prints out this information. | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 3 Node name: osboxes System name: Linux Release: 3.19.0-32-generic Version: #37~14.04.1-Ubuntu SMP Thu Oct 22 09:41:40 UTC 2015 Machine: x86_64</pre> |

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| Display small collection of files in the server upload directory (string < 15 byte length, starting mem alloc is 15 bytes) | Normal | The server should create a string showing all files in the servers upload directory. this should be done without having to realloc memory for the string pointer used (contains 15 bytes). File string should be f1 f2 f3 f4 which is < 15 bytes so no need to realloc | The server created a string showing all files in the servers upload directory. Memory did not have to be reallocated for the string pointer used, this is shown through the "entered" print message in the server code (present during testing only) included in the code for handling reallocs | <pre>Waiting for incoming connections... Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect... Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 4 Regular files in the servers upload dir: f4 f3 f2 f1 if ((int) strlen(regfiles) + (int) strlen(file) >= malloc_usable_size(regfiles)){ printf("entered"); char *regfiles_resz = realloc(regfiles, (int) malloc_usable_size(regfiles) * 2); regfiles = regfiles_resz;</pre> |
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| Display large collection of files in the server upload directory (string > 15 byte length, starting mem alloc is 15 bytes) | Extreme | The server should create a string showing all files in the servers upload directory. This should involve reallocating memory for the string pointer as the string will be more than 15 bytes. | The server created a string showing all files in the servers upload directory. The server reallocated memory used by the string pointer | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 4 Regular files in the servers upload dir: file9.txt file8.txt file7.txt file6.txt file5.txt file4.txt file30.txt file3.txt file29.txt file28.txt file27.txt file26.txt file25.txt file24.txt file23.txt file22.txt file21.txt file20.txt file2.txt file19.txt file18.txt file17.txt file16.txt file15.txt file14.txt file13.txt file12.txt file11.txt file10.txt file1.txt f4 f3 f2 f1 Waiting for incoming connections... Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect... entered entered entered entered</pre> |
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| <p>Getting specified file from server upload directory and saving in client executable working directory</p> | <p>Extreme</p> | <p>The requested file should have its file contents copied into a string by the server, then these file contents should be placed into the working directory of the client executable, within a file of the same name.</p> | <p>The requested file had its file contents copied into a string by the server, these file contents were successfully placed into the working directory of the client executable in a file of the same name as the original file.</p> | <div data-bbox="985 199 1671 272"> <pre>client client.o Makefile rdwrn.h client.c ip.txt rdwrn.c rdwrn.o</pre> </div> <div data-bbox="985 272 1912 641"> <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 5 Enter the name of the file to retrieve: testfile.txt client client.o Makefile rdwrn.h testfile.txt client.c ip.txt rdwrn.c rdwrn.o</pre> </div> <div data-bbox="985 647 2067 986"> </div> <div data-bbox="985 992 2067 1385"> </div> |
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| Requesting a file from the server upload directory that does not exist | Exceptional | The server should handle the error and avoid crashing while the client should display an error message informing the user why the error has occurred. | The server was able to handle the error and avoid crashing, an error message was also displayed to the user. I decided that the error message should be changed to be more accurate as to why the error occurred. | <pre>student@osboxes ~/cw2/client \$./client Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 5 Enter the name of the file to retrieve: notARealFile.txt file can't be opened or is unreadable Waiting for incoming connections... Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect...</pre> |
| Requesting a file from the server upload directory that does not exist (retest with changed error message) | Exceptional | The server should handle the error and avoid crashing while the client should display an error message informing the user why the error has occurred | The server was able to handle the error and avoid crashing. The client displayed the appropriate error message. | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 5 Enter the name of the file to retrieve: notARealFile.txt file doesn't exist or is unreadable Waiting for incoming connections... Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect...</pre> |

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| Selecting all options individually in one run of the client server application. | Normal | The server should be able to deliver all functionality even after other functionality has been used. Each component of functionality should not interfere with other components. | The server was able to deliver all functionality in a single run of the client server application. | <pre>Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 1 IP: 192.168.44.129 Student ID: S1507940 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 2 Sun Dec 10 17:07:25 2017 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 3 Node name: osboxes System name: Linux Release: 3.19.0-32-generic Version: #37~14.04.1-Ubuntu SMP Thu Oct 22 09:41:40 UTC 2015 Machine: x86_64 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 4 Regular files in the servers upload dir: testfile.txt file9.txt file8.txt file7.txt file6.txt file5.txt file4.txt file30.txt file3.txt file29.txt file28.txt</pre> | |
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file27.txt
file26.txt
file25.txt
file24.txt
file23.txt
file22.txt
file21.txt
file20.txt
file2.txt
file19.txt
file18.txt
file17.txt
file16.txt
file15.txt
file14.txt
file13.txt
file12.txt
file11.txt
file10.txt
file1.txt
f4
f3
f2
f1
1. Display server IP and student ID
2. Display server time
3. Display uname information
4. Display server upload dir files
5. Get specified file from server and save in client dir
6. Exit
option> 5
Enter the name of the file to retrieve: testfile.txt
1. Display server IP and student ID
2. Display server time
3. Display uname information
4. Display server upload dir files
5. Get specified file from server and save in client dir
6. Exit
option> 6
Goodbye!
student@osboxes ~/cw2/client $
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| Server handling multiple clients quitting and still running | Normal | The server should continue running even if a user exits the client program | The server continues running even if a user exits the client program. | <div><div><pre>Terminal File Edit View Terminal Tabs Help student@osboxes ~ \$ cd cwk2/client student@osboxes ~/cw2/client \$./client Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 6 Goodbye! student@osboxes ~/cw2/client \$</pre></div><div><pre>terminal File Edit View Terminal Tabs Help student@osboxes ~/cw2/client \$./client Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 6 Goodbye! student@osboxes ~/cw2/client \$</pre></div></div> <div><div><pre>terminal File Edit View Terminal Tabs Help student@osboxes ~/cw2/client \$./client Connected to server... 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 6 Goodbye! student@osboxes ~/cw2/client \$</pre></div><div><pre>terminal File Edit View Terminal Tabs Help student@osboxes ~/cw2/server \$./server Waiting for incoming connections... Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect... Connection accepted... Handler assigned Waiting for a client to connect... 54 Thread 140308834428672 exiting 54 Thread 140308842821376 exiting 54 Thread 140308851214080 exiting </pre></div></div> |
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| Entering invalid values into function choice menu | Exceptional | The client should output an error message. Both the client and server should continue to run | The client outputs an error message. Both the client and server continue to run. | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 0 Invalid choice - choose an option from 1 to 6! 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> ewjif Invalid choice - choose an option from 1 to 6! 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 7 Invalid choice - choose an option from 1 to 6! 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 99 Invalid choice - choose an option from 1 to 6! 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> -10 Invalid choice - choose an option from 1 to 6! 1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> █</pre> | |
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| Requesting files string when no upload directory is present on server | Exceptional | The server should inform the client no upload directory exists. The client should output an error message reflecting this | The server informs the client no upload directory exists. The client outputs an error message reflecting this. However | <pre>student@osboxes ~/cwk2/server \$ ls Makefile rdwrn.h server server.o rdwrn.c rdwrn.o server.c upload student@osboxes ~/cwk2/server \$ mv upload .. student@osboxes ~/cwk2/server \$ ls Makefile rdwrn.h server server.o rdwrn.c rdwrn.o server.c student@osboxes ~/cwk2/server \$</pre> <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client dir 6. Exit option> 4 error: no upload directory exists on the server</pre> |
| Requesting file when no upload directory is present on the server | Exceptional | The server should inform the client the file doesn't exist/ is unreadable. The client should output an error message to reflect this. | The server informs the client the file doesn't exist/ is unreadable. The client outputs an error message to reflect this. | <pre>1. Display server IP and student ID 2. Display server time 3. Display uname information 4. Display server upload dir files 5. Get specified file from server and save in client d 6. Exit option> 5 Enter the name of the file to retrieve: testfile.txt file doesn't exist or is unreadable</pre> |

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| Server signal handler operation on sigint signal received | normal | The server should output its total execution time then halt | The server outputs its total execution time then halts. | <pre>student@osboxes ~/cwk2/server \$./server Waiting for incoming connections... Waiting for a client to connect... ^C total execution time in minutes and seconds(mins:secs): 00:11 student@osboxes ~/cwk2/server \$</pre> | |
|---|--------|---|---|---|--|