**S2110978**

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**Systems Programming**

**CW2 - Testing**

**Testing**

Upon the completion of the implementation of the client-server interface, the program underwent a comprehensive test to ensure its robustness and functionality. The program was tested to ensure that it performed the functionalities as specified by the coursework specification. In addition the program was tested to ensure that it would be able handle invalid inputs and alert the users of such. The following is a detailed account of the test cases and their outcomes.

**Server Testing:**

Test ID 1.0: The server successfully initiated using the command ./server and awaited client connection, resulting in an "OK" status.

Test ID 1.1: Upon a client connecting, the server printed an appropriate message indicating the successful connection and assigned handler, achieving the expected outcome.

Test ID 1.2: When a client exited, the server gracefully handled the event, printing an appropriate message about the client's departure and thread termination, meeting the expected outcome.

Test ID 1.3: The server appropriately responded to a SIGINT or Ctrl+C signal, exiting gracefully and displaying the execution time as expected.

**Client Testing:**

Test ID 2.0: The client initiated successfully using ./client, displaying a menu and prompting the user to select an option, resulting in an "OK" status.

Test ID 2.1: Upon selecting option '1', the client displayed the server's hard-coded student name and ID prefixed with the IP address, achieving the expected outcome.

Test ID 2.2: Selection of option '2' led to the client displaying a random array generated by the server and the sum of its elements on the client's standard output, meeting the expected outcome.

Test ID 2.4: Choosing option '3' resulted in the client displaying the server's uname on its standard output, as expected.

Test ID 2.5: Selection of option '4' displayed a list of files in the upload directory on the client's standard output, meeting the expected outcome.

Test ID 2.6: Upon choosing option '5', the user was prompted to enter the name of the file to copy from the server, and the file was successfully copied to the client's current working directory, achieving the expected outcome.

Test ID 2.7: Selection of option '6' allowed the client to exit gracefully, meeting the expected outcome.

**Error Handling:**

Test ID 3.1: In case the upload directory did not exist, the server displayed an appropriate error message and returned to the menu as expected.

Test ID 3.2: If the specified file was not found in the upload directory, the server appropriately displayed an error message and returned to the menu as expected.

Overall, the server-client application demonstrated robust functionality and graceful error handling.

**Test Cases Table**

| **Test ID** | **Action** | **Expected outcome** | **status** | **Evidence** |
| --- | --- | --- | --- | --- |
| 1.0 | ./server | Start server and waits for client to connect | OK |  |
| 1.1 | Client connects | Print appropriate message to show client has connected and the handler assigned | OK |  |
| 1.2 | Client exits | Prints appropriate message that client has exited and the thread | OK |  |
| 1.3 | SIGINT or Ctrl+C | Exits server gracefully and displays the execution time | OK |  |
| 2.0 | ./client | Starts client and display menu and prompts user to select an option | OK |  |
| 2.1 | Select ‘1’ | Display server hard coded student name, ID prefixed with IP address | OK |  |
| 2.2 | Select ‘2’ | Display random array generated by server and sum of it element on client’s standard output | OK |  |
| 2.4 | Select ‘3’ | Display servers uname on client’s standard output | OK |  |
| 2.5 | Select ‘4’ | Display list of files in upload directory | OK |  |
| 2.6 | Select ‘5’ | User should be prompted to enter name of the file to copy from server and file should copied to client current working directory | OK |  |
| 2.7 | Select ‘6’ | Client should exit | OK |  |
| 3.1 | upload directory does exist | Display appropriate error and return to menu |  |  |
| 3.2 | File specified not found in upload directory | Display appropriate error and return to menu |  |  |