CO318 Project I: Multiuser Chatroom Server

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You will design and code a chat server capable of handling multiple clients using multithreading. When one client sends a message it must be broadcast to all clients connected to the server at the time.

Pay special attention to the following issues when designing, coding the server.

Client handling Your server must be able to gracefully handle new client connections and client disconnections at any time[1].

Threading structure Do you use a fixed number of threads or dynamically create and destroy threads to handle client communication and other tasks?

Synchronisation considerations Ensure there are no race conditions between threads on your server. If the server receives messages from two or more clients at approximately the same time both messages should reach others without being garbled.

Resource handling Proper allocation and deallocation of dynamic memory, socket descriptors and other any other resources used.

Hints

- Use the hints provided in the skeleton C file to structure your data and code.

[1] You may have a fixed maximum number clients

- To test on a single machine, connect using multiple `nc` instances. To automate testing with large message sizes redirect a file to stdin: `nc localhost 12345 < /etc/passwd`.
- Use `valgrind` to check for memory leaks.
- `http://www.drdobbs.com/article/print?articleId=212001285&siteSecti`
  `parallel`

Project organisation and assessment

The project should be done in groups of two. Each group must maintain an ongoing log of all their contributions as a Google doc.

Assessment will be based on

1. Correctness of implementation, paying particular attention to the points noted above.
2. Clarity, style and overall quality of code and comments in the source.
3. A 3-page report describing the server design with respect to the points noted above.
4. A viva-voce, where your individual contribution will be assessed based on your work log document.
5. Bonus marks for including automated test procedures and describing them in the report.

Individually assesed contribution will count for 70% of your mark.