

CSCI3240: Project 4

Requirement: Add concurrency to your Project3 solution. Your server should be able to handle multiple clients and address any concurrency issues discussed in the class. To handle race conditions, implement a reader-writer lock to ensure safe access to the records.csv database. When a client requests to add a new employee record, the server should acquire a write lock, preventing other clients from accessing or modifying the file until the operation is complete. This guarantees that no other clients can add records or read data from records.csv while the current write operation is in progress. Implement the reader-writer solution to prioritize write requests over read requests when necessary, ensuring consistency and data integrity.

Submission Instructions

1. You need to submit the following files.
 1. **client.c**: You will write the client code here.
 2. **server.c**: You will write the server code here.
 3. other files: It includes all the other header file or C files that you used for this project. (Example: **csapp.h** and **csapp.c**)
 4. **Makefile**: Your makefile should compile both client and server program. Also, make clean command should clear all the intermediate object files and the executables files.
 5. **records.csv**: It will include the firstname, lastname, zip code, department, and salary of employees.
2. Do not zip the submission.
3. Provide adequate comments on your C code.
4. If I need any clarification regarding your coding, you will need to come at my office hours to demonstrate and/or run the code.
5. Finally, after you are done, upload the requested files in "Project4" Dropbox in D2L.

Grading Rubrics:

1. Makefile missing: -5
2. If any required library files missing (such as csapp.c csapp.h): -5

3. Client file missing: - 10
4. Server is not concurrent: -100
5. Concurrency issue (Reader writer problem) not addressed: -40
6. If comments are missing and bad coding style: -5
7. If server terminates after clients closes the connection (server can only be terminated forcefully using ctrl+C key): -20
8. If search by name does not work at all : -10
9. If search by name fails to display multiple matching records with same full name: -5
- 10.If search by zip code does not work at all: -10
11. If search by zip code fails to display multiple matching records: -5
- 12.If search by salary does not work at all: -10
- 13.If search by salary does not work correctly for some comparison type ('>=', '<', etc): -5

Useful links:

<https://www.geeksforgeeks.org/readers-writers-problem-set-1-introduction-and-readers-preference-solution/>

https://course.ccs.neu.edu/cs3650sp20/Labs/7/reader_writer.c