Network Programming Project 3 - Remote Working Ground (rwg) Server

NP TA

Deadline: Sunday, 2025/4/27 23:59

1 Introduction

In this project, you are asked to implement a rwg server similar to part 2 of Project 2, but with differences:

- The server should use the **concurrent connection-oriented** paradigm, which means the server will create new process for each client. Each client must be isolated and operate independently from other clients.
- The clients should use **shared memory** and **FIFO** for inter-process communication.

The server must support all functions in part 2 of project 2.

2 Scenario

Same as Project 2.

3 Implementation Details

3.1 Working Directory

```
your_working_directory
    |-- bin
    |   |-- cat
    |   |-- ls
    |   |-- noop
    |   |-- number
    |   |-- removetag

    |---- user_pipe  (Will be created by the test script)
    | |-- (You should create your user pipe FIFO file here)
    |
    |-- test.html
```

4 Specification

1. You must use fork to create your npshell clients.
2. You must use shared memory to save client information.
3. You must use shared memory to broadcast or send message to clients.
4. You must use FIFO to implement user pipe. The FIFO files should be put under directory "user_pipe".

5 Submission

- E3:
  (a) Create a directory named your **student ID**, put ONLY your source code files into the directory. DO NOT upload anything else (e.g. np_simple, np_single_proc, noop, removetag, test.html, **.git**, **__MACOSX**)
  (b) You must provide Makefile. Executable file named np_multi_proc should be produced after typing **make** command **in top layer of the directory**.
  (c) All servers should listen on the port assigned by the first argument.

```
Example:
./np_multi_proc 12345 # Listen on port 12345
```

  (d) zip the directory and upload the .zip file to E3.
  Attention !! we only accept .zip format

```
Example:
312551034
    |-- Makefile
    |-- np_multi_proc.cpp
    |...
```

  Zip the folder 312551034 into 312551034.zip and upload 312551034.zip to E3

- Github Classroom:
  (a) Make sure you have accepted the invitation of Project 3.
  (b) You can push anything to Github Classroom, but make sure to commit **at least 5 times**.

6 Notes

1. We take plagiarism seriously. **You will get zero points on this project for plagiarism.**
2. You will lose points for violating any of the rules mentioned in this spec.
3. NP projects should be run on NP servers. Otherwise, your account may be locked.
4. Any abuse of NP server will be recorded.
5. Do not leave any zombie processes in the system.