

CSCI 4534 Operating Systems
Programming Assignment #3
Due: Monday April 22nd, 2024
Spring 2024

This assignment is meant to:

1. Build on the OS like platform you have developed to:
 - a. Simulate another OS function (in this case implement a message passing facility)
 - b. Capability for clients to send and receive messages.

Server program:

The server program will add the implementation of ONE message queue that multiple clients can issue request to send and receive a message.

The message format should be like the following:

Message Type (integer)
Message Length (integer)
Data (actual message)

(You can delete most other system calls from the server code as well as the client code, except the ones used to establish and terminate client connections)

Add **two new system calls**, a **message send**, and a **message receive** (retrieve?).

- a) **Message send.** Client should include its process id, system call number and the message being sent. The server should take the message and put it in a queue of messages. If another client is waiting for a message of this type, a reply should be sent to that client with the message. And acknowledgement reply should also be sent to the sending client.
- b) **Message receive.** Client should include its process id, system call number and the type of message requested.
 - If no message of that type is currently in the queue, no reply should be sent to the client (effectively blocking the client) and the client process id should be put in a queue of processes waiting for a message (including the type of message being waited on).
 - If one or more messages of the requested type is available, the oldest message of that type should be removed from the queue and returned to the client.

After each request, the server should print to the screen enough information to show which client is making the system call (either a) or b) and what the request was: client ID/number, type of request, and associated message if any). It should also print the reply(s) being sent. Optionally the server could also print the queue of messages.

Client Program:

- Modify the client program, to include options for the user to send and receive messages gathering the data from the user.

Create a zip file with both your programs source file(s) and upload to blackboard please.

Make incremental progress as you develop your code and back up your files often!!

Schedule a meeting with our TA the week after the assignment is due (or as soon as you get it finished) to do a DEMO of your programs or include a screen captured video showing multiple clients sending and receiving messages.