

# CCPS590 Lab 8 – Shared Memory in Linux

## Preamble

In this 8<sup>th</sup> and final lab, you will experiment with reading and writing shared memory between two programs. This is probably the trickiest and most difficult lab, but it's also the last one and the only thing you have to worry about for the next week or two until the exam.

## Lab Description

- 1) Look at writeP.c and readP.c and see how they share memory. Try running them. See below to see how I ran them.

```
> ./writeP &
[1] 28857
> ./readP 28857
-1
1
2
3
4
5
6
7
8
9
[1]+  Done      ./writeP
>
```

- 2) copy writeP.c and readP.c to w.c and r.c. Modify w.c and r.c so that the following interactions happen:

- w:** Fills array with 0-9 then sets flag to alert reader it may read now (sets flag by putting -1 in 0th slot).
- r:** Reads shmem, prints, resets flag (puts 0 in 0th slot), and then signals writer it may reload with new values (use signal 10).
- w:** Fills array with 10-19 then resets flag (-1 in 0th slot) to alert reader to read again.
- r:** Reads shmem, prints, then uses the **system()** function to perform **ipcs -m** to display the shmem segments, then signals writer to detach shmem and die.
- w:** Detaches shmem

**For your interest:** Listing and removing shared memory

Shared memory segments can be viewed/deleted from the shell using the commands:

```
ipcs
ipcrm
```

When I DO have a shared memory segment, listing, and removing it goes something like this:

```
> ipcs -m
----- Shared Memory Segments -----
key          shmid        owner      perms    bytes    nattch    status
0x0000004b   1594261505  aufkes    666      128      0
> ipcrm -m 1594261505
> ipcs -m
----- Shared Memory Segments -----
key          shmid        owner      perms    bytes    nattch    status
>
```

The final **ipcs** showed there are now no shared memory segments. Note: if you run **ipcs -m** in the shell AFTER running writeP and readP, there will be no shared memory listed because writeP deleted it.

## Submission

For this lab submit your files r.c and w.c. Labs are to be submitted *individually*! Make sure your code is clean and easy to read.