Announcements

- Program #2
  - Due next Thursday (3/3/16)

Writers Have Priority

reader

```
repeat
    P(z);
        P(rsem);
        P(x);
            readcount++;
            if (readcount == 1) then
                          P(wsem);
        V(x);
        V(rsem);
    V(z);
    readunit;
    P(x);
        readcount- -;
        if readcount == 0 then
                      V (wsem)
    V(x)
forever
```

writer

```
repeat
    P(y);
        writecount++:
        if writecount == 1 then
                      P(rsem);
    V(y);
    P(wsem);
    writeunit
    V(wsem);
    P(y);
        writecount--;
        if (writecount == 0) then
                      V(rsem);
    V(y);
forever;
```

Notes on readers/writers with writers getting priority

Semaphores x,y,z,wsem,rsem are initialized to 1

```
P(z);
    P(rsem);
    P(x);
        readcount++;
        if (readcount==1) then
                      P(wsem);
    V(x);
    V(rsem);
V(z);
```

readers queue up on semaphore z; this way only a single reader queues on rsem. When a writer signals rsem, only a single reader is allowed through

Sample Synchronization Problem

- Class Exercise:
  - **CMSC 412 Midterm #1 (Spring 1998)** Q#3
- Went over master solution

- Variables:

  Semaphore mutex = 1

  Semaphore writer = 0

  Semaphore reader = 0

  int nReader = 0

  int nWriter = 0

  int wReader = 0

  int wWriter = 0

Sample Synchronization Problem

- Class Exercise:
  - **CMSC 412 Midterm #1 (Spring 1998)** Q#3
- Solve a variation of the readers-writers problem, in which multiple writers can write at the same time. Specifically, there are readers and writers. Up to 5 reads at the same time are allowed, but only one write at the same time are allowed. A read and a write at the same time is not allowed. Provide a solution using semaphores with the following properties:
  - no busy waiting.
  - starvation-free (i.e. a continuous stream of readers does not starve writers, and vice versa) is desirable but not compulsory (but you will lose some points).
  - you cannot use process ids and you cannot have a separate semaphore for every process.