

# UNI CS 3430

## Operating Systems

### Suggested Exercise #4 (Due 2/12 in class)

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1. Why does locking via disabling interrupts not work on multi-processor architectures?
2. Write pseudo code to implement a “Too Much Milk” solution with two threads (robots) using the `test_and_set()` operation to implement mutual exclusion. Remember to define the `Lock::Acquire()` and `Lock::Release()` functions
3. The following is a modified solution for the consumer-producer problem, with bounded buffer. Does the solution work? If so, please defend your position. If not, please show a sequence of operations that leads to a failure of the solution.

```
semaphore nLoadedBuffers = 0; // consumer waits on 0
semaphore nFreeBuffers = N;  // producer waits on 0
                               // N >= 2
semaphore mutex = 1;         // one thread waits when
                               // another thread is
                               // modifying the
                               // buffer

Producer() {
    1. P(nFreeBuffers);
    2. P(mutex);
    3. // put 1 item in the buffer
    4. V(nLoadedBuffers);
    5. V(mutex);
}
Consumer() {
    6. P(nLoadedBuffers);
    7. P(mutex);
    8. // take 1 item from the buffer
    9. V(mutex);
    10. V(nFreeBuffers);
}
```