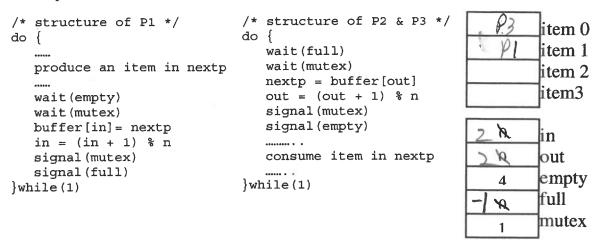
CSCE 311 Spring 2020

Process Coordination

Name: Due: 2/20/20

1. Consider a version of the bounded buffer problem in which there are one producer process (P₁) and two consumer processes (P₂ and P₃) all sharing the same buffer. Assume that the size of the buffer is n = 4, and that we start with a completely empty buffer. The structure of P₁, P₂, and P₃ as well as the semaphores and buffer is shown below:



Assume a preemptive scheduler and that all processes start in the ready queue at the same time in the order from head to tail, P1, P2, and P3 (P3 at the head of the queue). Let the process priorities be: P3 = 2, P2 = 2, and P1 = 4.

Draw the contents of the indices "in" and "out", as well as the state of the semaphores and the contents of the buffer *after 2 items have been consumed*. In the case of the buffers, simply notate each item with the name of the process that accessed it last.

```
P3: Full:-1 => P2 blocks
P2: Full:-2 => P2 blocks
P1: produce item, MT: 3, mux; 0, item 0: P1, in: 1, mux: 1, Full:-1

P3: mux: 0, item 0: 13, out: 1, mux: 1, mT: 4, consume item
P3: Full:-2 => P3 blocks + P1 resumes
P1: product it, mT: 3, mux: 0, item 1: P1, in: 2, mux: 1, Full:-1

P1: product it, mT: 3, mux: 0, item 1: P1, in: 2, mux: 1, Full:-1

P1: mux: 0, item 1: P2, out: 2, mux: 1, MT: 4, consumes item
P1: mux: 0, item 1: P2, out: 2, mux: 1, MT: 4, consumes item
```