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CMPS 3600 OS

Lab 07

In the screenshot below we utilized semaphores to increment and decrement the count of the buffer. Once producer is full, it has to wait until the consumer consumes some data. The consumer has the opposite problem, which is to wait once the producer begins to produce. The screenshot displays which thread is being produced and consumed. Although the output can change every time the executable is ran, we know the output is correct because the threads are consumed in the same order they were produced.

```
nkalar@odin:~/3600_Su19/lab07$ gcc Kalar_Nicholas_Lab07.c -lpthread -lrt
nkalar@odin:~/3600_Su19/lab07$ ./a.out
[P0] Producing 0 ...
[P0] Producing 1 ...
[P1] Producing 0 ...
[P1] Producing 1 ...
-----> [C1] consumed 0 ...
-----> [C1] consumed 1 ...
-----> [C0] consumed 0 ...
-----> [C2] consumed 1 ...
[P2] Producing 0 ...
[P2] Producing 1 ...
-----> [C0] consumed 0 ...
-----> [C2] consumed 1 ...
[P1] Producing 2 ...
[P1] Producing 3 ...
[P0] Producing 2 ...
[P0] Producing 3 ...
-----> [C1] consumed 2 ...
-----> [C1] consumed 3 ...
[P2] Producing 2 ...
[P2] Producing 3 ...
-----> [C0] consumed 2 ...
-----> [C0] consumed 3 ...
-----> [C2] consumed 2 ...
-----> [C2] consumed 3 ...
nkalar@odin:~/3600_Su19/lab07$
```

Conclusion:

We learned about the significance of using semaphores to allow the critical section of a program to continue. Once the producer is full, it waited until the consumer consumed the data and vice versa. This fixed the consumer-producer problem for this program.