

EECS 678: Lab 7 - Producer Consumer

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1 *Briefly describe the problem you are trying to solve and describe the design of your solution.*

The objective provides that the producer and consumer must perform their assigned duties in a concurrent fashion. To facilitate this objective, the producer must not over produce items, and the consumer must not over consume items; meaning the queue boundaries must be respected. The use of mutually exclusive pthread locks provides safe concurrent execution.

2 *Discuss why the busy-wait solution is inefficient for threads running on the same CPU, even though it produces the "desired behavior".*

The busy-wait solution keeps both producer or consumer chewing up CPU cycles in the event of a queue boundary condition, EMPTY or FULL. This is very wasteful, when they may as well be waiting idly.

3 *You will need to argue from your narrated output as to why your solution is correct. Note, your output will likely not match the output listed here exactly. Two successive runs of your application will probably not match even vaguely, due to random variations in how threads are scheduled. However, your report should discuss each of the following points and discuss how your output supports your discussion of each:*

- *Are each producer and consumer operating on a unique item? Is each item both produced and consumed?*
- *Do the producers produce the correct number of items and the consumers consume the correct number of items?*
- *Does each thread exit appropriately?*
- *Does your solution pass the above tests with the different numbers of producer and consumer threads in the Makefile tests?*

The implementation of pthread locks surrounding the queue interactions and work production assure operation on unique items. The narratives display this fact in that no producer produces the same value as another, and no consumer consumes the same value as another. Additionally, the producers and consumers correctly produce/consume the allotted amount of items. The producers and consumers exit according to their station after the correct number of interactions have occurred, the narratives display this as well. Finally, there appears to be no deviation from the expected output after running the Makefile tests. Namely, the differing values of producers and consumers produces expected results.