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First Come First Serve (FCFS)

- Rows 2-4 are our baseline calculations
- Rows 5-7 are when there are many more consumers than producers. It makes sense that the wait times would be shorter here, since there are more consumers to pull products off the queue than before, so the products will not stay in the queue as long. The consumer throughput is also slightly higher, for the same reason.
- Rows 8-10 are when there are many more producers than consumers. Turnaround and wait times are both greater since we have so many producers and so little consumers, the queue is almost always full, so products wait longer in the queue. Also, producer throughput is higher because there are more producers.
- Rows 11-13 are when there are many products made. With an even amount of producers and consumers and a larger queue size, total processing time is longer because way more products are being processed. Wait and turnaround times are larger because there is a larger max queue size, so products can stay in the queue longer. Producer and consumer throughput is higher because there are more producers and consumers.
- With unlimited queue size the average wait and turnaround times are longer because the queue is constantly being filled.

Round Robin

- Rows 18-26 have various quantums. For small quantums, processing, turnaround, and wait times are all long because most of the time is spent switching between processes, rather than doing work on products. For very large quantums, the values approach first come first serve, because large quantums almost always finish the product the first time it is removed from the queue, which is FCFS.
- Rows 27-29 have more consumers than producers. Average wait time and turnaround time are less for the same reasons as having more producers in FCFS.
- Rows 30-31 have more producers than consumers, and have the same effects as the same situation in FCFS.
- Rows 33-35 make more total products. All times were higher, like in FCFS, but wait times were not as much higher because round robin helps keep wait times minimal.
- Rows 36-38 have no max queue size. All times were longer, for similar reasons to FCFS. Wait times were especially increased, since round robin had to split its time over a large amount of products since the queue usually had a lot of products in it. This hurts consumer throughput.

Overall

For this simulation, the FCFS was better than Round Robin essentially all the time. It should be that Round Robin has shorter wait times, but this can be possibly explained by:

- This is only a simulation, so computer dependent factors could change this
- Round Robin sleeps for 100ms every time it does work, while FCFS sleeps only once. Therefore, Round Robin sleeps more, which wastes CPU time and hurts performance.