(last minute Lauren Sachs was working on the statistics and screwed up the numbers so we have not included those in our analysis)

First Come First Serve:

The number of consumers compared to producers was the biggest influence on wait time and turn-around. The ratio between the two dictates how long products have to wait before being consumed. When the ratio was even, with the same queue size and products to be produced, the average wait time was fairly high. While with a 1:2 ratio of producers to consumers, the average wait time dropped and so did the turnaround lowered to .39 milliseconds. When this ratio is flipped to 2 Producers to 1 Consumer, the average time to consume skyrockets to. When there are more producers, they are consistently in control of the scheduling mutex, and the consumers are denied access more frequently leading to starvation. Without access to the scheduling mutex, the consumers cannot get products to consume, so the products have to sit in the queue longer than when there is a even back-forth between producers. The runtime is unaffected by having more consumers than producers, since the same amount of work is being done, just by more consumers. But when you have less consumers than producers, the run time increases since the producers are taking control of the scheduler mutex, preventing the consumers from being able to consume.

Round-Robin:

The quantum value and number of consumers is what affects Round Robin scheduling the most. As we send a larger quantum value, the turnaround drops. Since the life of a product ranges from 1-1024, a small quantum, such as 10, could take up to 100 rounds to complete consumption. Once we send a quantum greater than 1024, the turnaround time stays approximately the same as FCFS with the same parameters. Increasing the number of consumers also decreases average turnaround time since more consumer threads are able to

consume. The producer-consumer ratio changes the numbers about the same as the same as in FCFS. The main performance difference between Round Robin scheduling and FCFS is the run-time with a low quantum value.

Overall, we found that FCFS was far faster than Round Robin, since each product is consumed the first time it is dequeued, rather than taking multiple rounds to complete consumption.