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Assignment 6: Simulation Analysis

1. At least two checkout lines are needed in order to serve all customers. If only one is used, around 100 customers are still in line when the simulation ends. If two or more checkout lines are used, there is typically only one or two customers left in line at the end of the day.
2. In order to serve ALL customers in five ticks or less (max = 5), three checkout lines are needed. To serve everyone in less than 20 ticks (max = 18), two checkout lines are needed. With only one checkout line, about 100 customers were still in line at the end of the simulation.
3. If I were the owner, I would have two checkout lines open. That way, every customer will be served by the end of the day, and on average in less than one minute. If there were competition in the area, however, I would open up three checkout lines to make sure everyone was served almost immediately at every time of the day, which would justify the extra $3,600 per month that it would cost.

The ideal number of checkout lines to have open is two. With two checkout lines open, the average actual wait, which is the time they spent waiting in line not being helped, was about 0.75 ticks, or ~45 seconds. With three checkout lines open, the average wait was nearly 0 (0.03 ticks), and with only one checkout line open, there was about 100 people stuck in the store at closing time.

In actuality, a convenience store with this many regular customers could afford to open up a third checkout line for added convince for the customers. A better strategy might be to allow that short line to happen and place easy to grab items, such as soda bottles or magazines near the register so that people would decide to buy those add-on items as they wait.