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## Project 04

### Grocery Store Simulation Efficiency

My simulation found that the most efficient layout of checkout lanes for the arrival.txt file is to have 9 regular checkout lanes and 3 express lanes. A big thing to consider is that adding or removing a single lane with this amount of customers throughout the day can change the average wait time exponentially. For this layout I found that the average wait time was 14.55 minutes. Changing to 10 regular lines and 2 express lines brings the average wait time to 18.79 minutes and going one “step” in the other direction with 8 regular lines and 4 express lines brings the average wait time to 34.4 minutes. For this number of customers, the ideal scenario is definitely going to be the layout with 9 regular lines and 3 express lines. The only time it would make sense to keep some of the other lanes shut down would be if you use a smaller customer amount (arrival simple, arrival medium).

Regular Lanes	Express Lanes	Average Wait Time
6	6	107.98
7	5	65.96
8	4	34.4
9	3	14.55
10	2	18.79
11	1	29.18
12	0	40.36