

Project Description

The main purpose of the simulation is to replicate the customer walking flows and purchasing behaviours in a supermarket. We want to understand the relationships between the counter queues and number of counters, along with the flow rate of customers. We can vary parameters to see the individual effects.

Before starting on the decision rules, we wanted to modify the structure of the code such that it will be more convenient to use for our future progress of the project. The strategy that we came up with was to have all the agents and environment variables to be object-oriented. It would be convenient to add a specific function into the objects as well such as making the agents non-colliding or adding decoration layouts in our simulation.

During the initial phase of our models, we designed the layout of the supermarket such that it is similar to most supermarket in Singapore. We also designed the agent based simulation such that each customer (agent) will not collide with each other based on some probability algorithm that we came up with. The probability algorithm will also model the expected movements of each customer when they reach a certain region of the supermarket. Finally, the customer will queue at the counters and wait for their turn before they make their payments and exit the supermarket.

From what we have learnt from Wk 10 Lecture, we have applied a thinning poisson process for our arrival of customers so that we will be able to analyse the output better. We will be collecting the statistics for the average total time that the customers stays in the supermarket and conduct a steady state analysis regarding the total time spent in the supermarket of the customers.