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CS150
Due: September 27th 2015

Description of Project 1

For project 1, we have to design the Easton Farmer's Market and develop a simulation to manage the Easton Farmers Market with goals and restrictions. The goals include minimizing the time spent in line for each customer, to satisfy as many requirements for each customers as possible, to ensure that the market meets at least 50% of every customers needs and to maximize the number of people going through the market. The market constraints include the hours of the market which are 9:30 am to 1 pm, the market capacity of 750 units in which the stalls, workers and customers cost some amount of units, and the type of stalls to be considered. Other than the capacity restrictions, the rest of the project decisions are up to us. We can decide if we want to have more than one of each type of stall or we can have more than one line instead of more than one stall.

The customers have to be produced every 61 seconds with a standard deviation of 31 seconds. Each customer should be created as an object. In order to decide what the customer wants from the market, there should be a random product generator which randomly decides what stalls each customer wants to go to. The customer can go to one stall or can go to all six stalls and the customer can also go to the same stall several times. Some stalls, like vegetables and diary, are more popular than others so the amount of people who will go to those stalls will be greater than the amount of people who go to other stalls. This needs to be factored into how the market is designed because some stalls will need to have more than one stall and other can just have a couple lines. However, maybe it is more time efficient and productive to add more lines to one stall instead of creating a whole new stall which will take up 15 units from the capacity. These are things that needs to be figured out after we have implemented our code and we can test it out. After the customer has been randomly assigned to stalls, they get on line for each stall whose products they need. The customers have to know that if they need a product from the meat stall, that they need to get on line for the meat stall. This can be accomplished by creating a queue for each stall and adding the customer object to that queue. Maybe for the customers to know which stall they need to go to, I can number the stalls to make it easier for the computer to process. The customers will be served at each stall in a first in first out manner using the methods included in a queue. When the customers reach the front of the line, the workers at the stall will “check them out”. The customers are taken off of the queue and they go to their next stall to wait on another line or they leave the market if they have finished going to all the stalls they need to go to.

There are also extensions and simplifications that I can do to make the project and the data collected from the project more interesting. For extensions, I can add additional workers to the stall. Each additional worker will be able to manage a line. Maybe having more workers will help get the customers in and out quicker. If there are more than one line at one stall, maybe that will avoid having one long line. Instead, there might be lots of smaller, more maintainable lines. For the simplification, I can shrink the time the market is open until. This would be interesting to see how many customers get all their desired items in that short of a time compared to the amount of customers who get all their desired items during the longer market hours.