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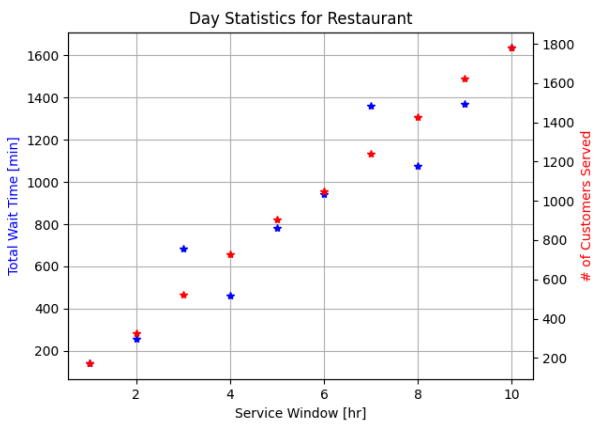
AERO 470

DES Queuing Assignment

Using the provided DES queuing template, I developed the submitted file, *FastFoodQueue.py*, as a solution to the problem. It creates a Restaurant object given the service window (maximum time a customer can enter the store), number of servers, and average service time. Then methods can be called on the object to simulate opening, running, and closing of the restaurant using the DES queuing methods exemplified in class. Given the example and parameters in the template (average service time = 1./4, number of staff = 1) and a service window of 5 hours, an example read out after closing the restaurant is as follows.

872 customers arrived at the restaurant
872 customers departed from the restaurant
The final clock was 300.21 min
The total wait time was 715.64 min

The total wait time varies based on the iteration and randomly generated customer arrivals, and it will increase when many customers come in quickly and overload the one server. The below left graph shows how the total weight time and number of customers served vary given different service windows with one server. It shows that more customers enter the store given a larger service window and total wait time follows a similar trend, which is as expected.



This next graph on the right shows how total wait time varies with different numbers of servers. Here the service window was held constant at 10 hours and the average service time was increased from ¼ to 3 to increase the chance of a surge of customers occurring. As expected, the total wait time decreases given a larger staff of servers.