**MCP261 IE Lab I: Exercise 5 February 11, 2019**

**Introduction to Discrete Event Simulation**

Download the TTF simulation code (in Matlab) from [here](http://users.iems.northwestern.edu/~nelsonb/IEMS435/).

Consider a system with two machines – one is an active machine and the other is an inactive spare. The spare machine becomes active when the (currently) active machine fails, while the failed machine immediately starts repair. The failed machine becomes the spare when its repair is completed. Only one component at a time can be repaired, so the system as a whole fails if both components have failed, and it is operational as long as at least one of the components is working.

1. (5 marks) Go through the Matlab code and develop a simulation of the same system in Python. Show that the results from your Python version of this simulation are statistically identical to that of the Matlab version.
2. (3 marks) Modify the system in Problem 1 such that time to repair is 2.5 days with probability 0.65 and 1.5 days otherwise. Find the average time to failure by programming 100 replications.