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SIE431/531 Simulation Modeling and Analysis
Homework 2

Problem Statement:
Five identical machines operate independently in a small shop. Each machine is up (that is, works) for between 7 and 10 hours (uniformly distributed) and then breaks down. There are two repair technicians available, and it takes one technician between 1 and 4 hours (uniformly distributed) to fix a machine; only one technician can be assigned to work on a broken machine even if the other technician is idle. If more than two machines are broken down at a given time, they form a (virtual) FIFO "repair" queue and wait for the first available technician. A technician works on a broken machine until it is fixed, regardless of what else is happening in the system. All uptimes and downtimes are independent of each other. Starting with all machines at the beginning of an "up" time, simulate this for 1,600,000 hours and observe the time-average number of machines that are down (in repair or in queue for repair), as well as the utilization of the repair technicians as a group.

Summary of Results:
I experienced an error when running my model that I am still debugging. The simulation replication ends at 443.62 minutes. Though I have specified a Replication Time of 1,600,000 and set Base Time Units to minutes, the simulation runs on an infinite loop whilst stating that the replication run time is 443.62 minutes. I am not sure if this is due to a conditional logic statement that is causing my model to crash. Therefore, I was unsuccessful in finding the time-average number of machines that are down (in repair or in the queue), as well as the utilization of the repair technicians as a group.