# BZAN 546: Homework #2

Due Monday, April 17th @ 11:59pm

1. The process of insuring a property consists of four main activities: review and distribution, underwriting, rating, and policy writing. Four clerks, three underwriting teams, eight raters, and five writers perform these activities in sequence, as shown in the flowchart below. The time to perform each activity is exponentially distributed with an average of 40, 30, 70, and 55 min, respectively. On the average, a total of 40 requests per eight-hour day are received. Interarrival times are exponentially distributed.
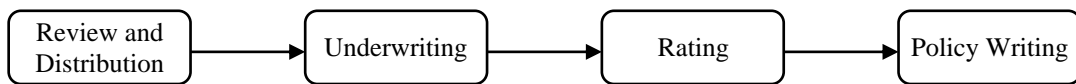
a. Develop a simulation model of this process. The model should simulate 10 days of operation. Assume that work in process (WIP) at the end of each day becomes the beginning WIP for the next day.
b. Calculate the following performance measures for each step in the process: resource utilization, waiting times, and queue lengths.
c. Build plots of the number of insurance requests in WIP (either awaiting processing or being processed) at each step.

2. Parts arrive at a single-machine system according to an exponential inter-arrival distribution with mean 20 minutes. Upon arrival, the parts are processed at the machine and the processing-time distribution is TRIA(11, 16, 18) minutes. The machined parts are inspected for quality and about 25% are sent back to the same machine to be reprocessed (assume same processing time). Create an ExtendSim model to represent this problem and run the simulation for 20,000 minutes to observe
a. The average number of parts in the machine's queue.
b. The current part waiting time in the machine's queue (include a plot).
c. The average part cycle time (time from a part's entry into the system to its exit, after however many passes through the single-machine system are required).
d. The average and the maximum number of times a part is processed.