CS 6210: Perf. Eval. of Computer Systems; Aug. 2011, Prof. Krishna Sivalingam
Tutorial 4, Sep. 21, 2011, OPEN BOOK/NOTES; CLOSED NEIGHBORS. TA help can be requested.

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1. (3) Consider an M/M/1 system with $\lambda = 0.8$, $\mu = 2.0$. What is the 90th percentile of response time?

2. (4) Consider an M/M/1/B system with $\lambda = 0.8$, $\mu = 2.0$. What should be the value of B such the packet drop probability is less than 0.0001?

3. (10) Consider a M/G/1 system with $\lambda = 2$. The service times can take one of five possible values with the corresponding probabilities as follows: p(0.2) = 0.1; p(0.3) = 0.1; p(0.4) = 0.5; p(0.6) = 0.2; p (0.8) = 0.1, i.e. probability that service time is 0.2 units is 0.1 and so on.

   Determine $E[n_q], E[n], E[w], E[r]$ for this system.

4. (8) Consider a TDM based link operating at 100 Mbps and shared by with 8 users. Let the packet arrival process be Poisson with rate of 1000 packets-per-second; the packet lengths are fixed at 1250 bytes. What is the average per-packet delay?

5. (Optional) Consider an M/M/m/m system with $\lambda = 0.4$, $\mu = 1.0$. What should be the value of m such the blocking probability is less than 0.001?