Announcement: The mid-term exam will be on Monday, May 3 during class. It will be open book/open notes.

Read to end of section 3.5 – skim through section 3.6-3.8 (this material is not on the mid-term)

Do the following problems:

1. Problem 3.34

2. Problem 3.37 (give a numerical answer)

3. Problem 3.40

4. Consider an M/G/1 queue with the following variation – when certain packets enter the server, the server requires a fixed overhead time of $D$ seconds, before serving the packet -- during this time the server is idle. Each packet requires this overhead with probability $p$ independent of the packets service time or arrival time. Packets arrive according to a Poisson process with rate $\lambda$ and are served FCFS. The first and second moments of a packet’s service time are $\bar{X}$ and $\bar{X}^2$ respectively.
   
   a. For what values of $\lambda$ is the system stable?
   
   b. What is the steady-state probability that the server is idle?

   c. What is the average waiting time in the queue for a packet? (Hint: your answer should be something like the PK formula)

   d. Suppose that the packets that do not require the fixed overhead are given non-preemptive priority over the packets that do. What is the average delay in the system (queueing time plus service time) for these packets?