EE549: Problem Set #1
Due Wednesday, Jan. 21, 2009

Note: For "design-your-own-problem" assignments, your stated problem and solution should be as complete, clear, and detailed as the example problems/solutions from 2008. In particular, your problems should be understandable and solvable via the techniques learned in class.

0. Readings and Practice

Read supplementary lecture notes 1 and 2. Do the practice problems from problem set 1 from 2008, but do not turn your answers to these practice problems in. Note that the questions and solutions for these practice problems are available on:

http://www-rcf.usc.edu/∼mjneely/ee549/

I. Generalizing the Car Departure Problem — to turn in for grading

The point of problem IV (PS 1, Spring 2008) was to compute departure rates using renewal theory and the law of large numbers. It was also designed as a "reminder" of the basic probability concepts associated with computing the expectation of a function of multiple random variables. Design your own problem by generalizing problem IV (Spring 2008) to a case with three windows.

Present your problem question clearly. Then present your solution (to your own problem) clearly.

II. Generalizing the Rate Example — to turn in for grading

The point of problem II (PS1, Spring 2008) was to compute time average rates using the law of large numbers. In particular, the problem was designed to show the importance of finding "renewal" points in the timeline for which we can legitimately apply the law of large numbers. Design your own problem about computing a time average rate (either for an $N(t)$ packet arrival process, an $X(t)$ bit arrival process, or a $\mu(t)$ server rate process).

Present your problem question clearly. Try to make it an interesting problem. Then present your solution (to your own problem) clearly.

III. True/False — to turn in for grading

Make sure to try out the True/False questions on problem VI (PS1, Spring 2008) before looking at their solution (do not turn these in). Turn in the following: Choose one of the 3 sentences below which best applies to your case, and write that sentence on your homework paper.

i) "I answered all of the True/False questions correctly, before looking at the solutions."

ii) "I was fooled by at least one of the True/False questions."

iii) "Unfortunately I looked at the solutions to the True/False questions before attempting to solve them myself, and so I don't know if I would have been fooled by them."

(Note: Just be honest with your answer. You will receive full credit for this part as long as you give an answer).