IEMS 326, Homework 1, Due 10/8/2012

Please see the homework policies in the syllabus, especially about charts and spreadsheets.

1. (Simple Calculations)
   a) Newnan et al. chapter 5 problem 24.
   b) Luenberger, chapter 3 problem 3 (p 68). [Hint: look up the definition of expectation from your probability course.]

2. Modify the social security spreadsheet to answer the following questions. Do not show your work and do not turn in the spreadsheet.
   a) Suppose that due to the recession labor force participation among 18-64 is only 69% but among 65+ it is 20%. What effect will this have on the time until the trust is empty?
   b) How much must the tax-rate be increased so that the trust fund is still solvent in 2050?
   c) This is open-ended. List the parameters which have the most impact on the trust fund solvency. Also make a chart illustrating this.

3. (Saving for retirement) Suppose that you start a job in January 2013 at the age of 22 (suppose your birthday is Jan. 1). It pays 60k the first year, and you expect raises of 10% a year for the first 10 years as your career progresses. Subsequently you have 5% raises a year. What is your salary when you are 65? Suppose you have a retirement plan that earns a 7% annual return. Each year you plan to put x% of your salary into this retirement plan. If you want to have $2m in this plan when you retire before you turn 66 (i.e., in December 2056), then how big must x be? Suppose x=15% and you plan to live until you are 82 and hope to have $80k a year in retirement. Then how long must you work before you can retire? Turn in a 1-page print-out of a spreadsheet highlighting your answers.