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.*