Problem Set 1
Econ 100B

Problem sets are due to your GSI in Section on Wednesday February 23 or Thursday February 24. Do not leave problem sets in the GSI’s mailbox. Problem sets that are a day late lose half the credit; see the course syllabus for other details.

1. (3 points.) Will the expenditure side of the GDP accounts be affected by the following transactions. Explain your answer, and if your answer is yes, indicate which components of GDP will be affected.

   a. A limousine company buys a new Cadillac.
   b. You buy a new Cadillac to go on a vacation.
   c. A taxi company buys new taxi cabs from London.
   d. A pizza company buys your old Cadillac to deliver pizzas.
   e. In 2004, GM makes a Cadillac that no one buys that year.
   f. In 2005, GM sells the Cadillac it made in 2004 to the limousine company.

2. (2 points) Suppose that you only consume apples and oranges. In 2004, apples cost $1 each and oranges cost $2, so you buy 6 apples and 3 oranges. In 2005, both apples and oranges cost $2 each, so you buy 2 apples and 4 oranges.

   a. With 2004 as the base year, calculate a Consumer Price Index for each year.
   b. How much does your nominal spending on apples and oranges change?
   c. How much does your real spending change?

3. (3 points) Assume that the production function is given by \( \frac{Y}{L} = \left( \frac{K}{L} \right)^{\alpha} E^{(1-\alpha)} \), where \( \alpha = 0.3 \) and \( E = 1.5 \).

   a. Graph the production function for values of \( K/L \) from 1 to 10. Next, show what happens to the production function if \( E \) rises to 3.
   b. Now assume that \( s = 0.15 \), \( \delta = 0.05 \) and \( g = n = 0 \). Use a graph to determine the equilibrium value of \( K/L \) (that is, the equilibrium capital-labor ratio) and \( Y/L \) (output per capita).

      (Hint: One way to do this is to graph the curves \( i = sy \) and \( i = (n + \delta + g) k \).)
c. At what rate does Y/L grow in this model? At what rate does Y grow?

d. Optional. Compute the equilibrium K/L and Y/L using math. (Begin by writing the production function as $\frac{Y}{L} = \left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}} E$ and then substituting the appropriate values.)

4. (2 points) In recent months a number of newspapers and journals have published articles expressing concern about how the U.S. could be adversely affected if the Chinese, or some other foreign countries, stopped buying U.S. government securities, that is, if they stopped lending to the U.S. government.

Use your knowledge of the Solow model to discuss this argument, indicating where in the model such a change might show up; then, show how this change would affect (a) the capital stock per worker, (b) output per worker and (c) the growth rate of output per worker in the long run. (You can use either a graph or math to answer this question.)