Math 100 — Assignment 9 (MATLAB), due Oct. 16, 2012

You may again submit a diary file of your work session. However, if you write or use any M-files, please submit them as well so that I can reproduce your work.

The first two problems are taken from our textbook *Experiments in* MATLAB.

At some time you should also read Chapter 1 of Timothy Gowers' *Mathematics: A Very Short Introduction*.

1. Do Exercise 8.2 (expgui).
2. Do Exercise 8.3 (Computing e).
3. Let's assume you have the same $20,000 student loan at 10% annual interest we considered in class, but you now plan to make *bi-weekly* payments in order to pay off the loan in 3 years.
   (a) How much will those payments be? Use MATLAB to find the answer.
   (b) How much will you save by making bi-weekly payments instead of monthly payments?
4. (a) Look up the current U.S. population at `http://www.census.gov/main/www/popclock.html`.
   (b) Use the MATLAB code discussed in class to predict the size of the U.S. population ten years from now with the population you found in (a) as initial condition.
      i. Use an exponential growth model
      $$P'(t) = rP(t),$$
      with the growth rate r taken from `http://en.wikipedia.org/wiki/List_of_countries_by_population_growth_rate`.
      ii. Use a logistic growth model
      $$P'(t) = \left(r - r\frac{P(t)}{C}\right) P(t),$$
      with the same growth rate as above and a carrying capacity of $C = 350,000,000$ people.