Econ 417a/561b
Yale University
Spring 2016
Prof. Tony Smith

PROBLEM SET #1

*This problem set is due by 4PM on Wednesday, January 27. Please submit your programs and output via Classes*v2 under Assignments. Although you may discuss the problems with others, you are expected to write your own answers (and programs).*

1. Using the Matlab code contained in the "Price" folder under Resources, calculate the market-clearing price for the following values of (a, b, ϵ): $(1, 0.1, 1)$, $(2, 0.1, 1)$, $(1, 0.2, 1)$, $(1, 0.1, 2)$.

2. Use the command `fsolve` in Matlab to find the market-clearing price for the parameter combinations in the first problem. To do this, first create a function called `excess` which takes price as an input and then calculates excess supply. Next, at the command prompt in the Command Window in Matlab, execute the command `fun = @excess`. This command creates a so-called "function handle" so that you can pass the function `excess` as an argument to `fsolve`. Finally, execute the command `pclear = fsolve(fun,x0)`, where `x0` is an initial guess for the market-clearing pricing. Compare your answers to those in the first problem.

3. Let r_t be the real interest rate in year t. As of year 0, the present value of one dollar delivered in year T is:
$$q_0 \equiv \Pi_{t=0}^{T-1} (1 + r_t)^{-1}.$$
Given a sequence of interest rates $\{r_t\}_{t=0}^{T-1}$, stored in the form of an array, write a program in Matlab to calculate q_0. Your program should work for any value of T.

4. Go to `http://quant-econ.net/py/index.html`, the home page for *Quantitative Economics* by Sargent and Stachurski. Follow the directions under "Setting up Your Python Environment" for installing Anaconda and opening Jupyter notebooks. We will use this software in lecture on January 27.