Mathematical Economics:
Homework

January 15, 2014

Collected Assignments Assignments will be listed below as they are assigned. Each assignment is due before the start of the subsequent class, unless otherwise stated. Homework submissions must be typed and submitted in the specified formats. You should submit a *single* email for each assignment. I require that you type analytical homeworks and submit them as PDF. I strongly recommend that you use Mathematica, which is available in the labs on campus. (You are welcome to type your HW in LaTeX or LyX, as long as you submit a beautiful PDF.)

Make sure you do a Mathematica tutorial before attempting to write up your homework! Submit a *single* email for each assignment. The email should contain one or two attachments. Generally one attachment will be a single PDF (.pdf) file containing your answers to all the analytical exercises. Another attachment may be a single program file. (E.g., .py for a Python program.) A single file should contain your answers to all the computational exercises for each homework. (Exception: you may do some problems in Python and some in Mathematica, if you prefer.)

Discussion Sections Be sure to read the discussion sections for the computational problems. In addition to providing hints, they sometimes include details about the problem *requirements*.

Computational Exercises: I sometimes classify as "computational" exercises that could easily be done with a calculator. These really emphasize the conceptual rather than the computational aspect; I just don't want you to attempt the computations by hand.

Python Completing the computational exercises in Python will often require NumPy, which is a Python package that is included with most scientific Python distributions. (If yours lacks NumPy, you can download it separately. Windows users can just download the .exe file, double click it, and follow the instructions.)

Once NumPy is installed, you access the matrix class in one of the following ways:

```
#best way (but least convenient)
import numpy as np
x = np.mat('1 2; 3 4')

#2nd best: import just the command you want
from numpy import mat
x = mat('1 2; 3 4')

#worst but most common: import all numpy commands
from numpy import *
x = mat('1 2; 3 4')
```

That final way is used in the tutorial at `http://www.scipy.org/Tentative_NumPy_Tutorial` and in the examples at `http://www.scipy.org/Numpy_Example_List#head-eaa4642e823ec09457d29d79b568575e9f02b214`.

Mathematica Programming In the Torrence and Torrence book, you should read section 8.5. The online Mathematica documentation is also *excellent.* E.g., `http://www.wolfram.com/broadcast/video.php?channel=89&video=409`.

References

Battalio, R. C., J. H. Kagel, R. C. Winkler, E. B. Fisher, Jr., R. L. Basmann, and L. Krasner (1973). A test of consumer demand theory using observations of individual consumer purchases. *Western Economic Journal 11*, 411–28.

Carter, M. (2001). *Foundations of Mathematical Economics*. Cambridge, MA: MIT Press.

Gallant, A. R. (1997). *An Introduction to Econometric Theory: Measure-Theoretic Probability and Statistics with Applications to Economics*. Princeton, NJ: Princeton University Press.

Kreps, D. M. (1990). *A Course in Microeconomic Theory*. Princeton, NJ: Princeton University Press.

Steindel, C. (1995, December). Chain-weighting: The new approach to measuring gdp. *Current Issues in Economics and Finance 1*(9), 1–6.

UNDP (2004). *World Population to 2300*. New York: United Nations.

Past Assignments