First Assignment, Darren Grant, ECON 3318, Summer 2006.

Written Problems. Most of the problems are assigned just for practice–you don't need to turn them in. The answers to all even-numbered questions are in the back of the book, and I will take questions at the beginning of most class periods, in which you can ask about any problem that is just for practice.

The due dates are listed on the calendar. These problems should be written up neatly, clearly, and completely and handed in strictly on time. You are allowed to work with classmates on these problems under the following conditions:

- You work with no more than three other classmates (max group size of four).
- You identify the names of the individuals with whom you worked on your paper.
- Working with classmates (permitted) shall be distinguished from copying from classmates (not permitted). Ask if you don't know the difference.
- Each student turns in his own paper; it shall not be identical to groupmates' papers (see above).

Please recall that the primary purpose of doing the homeworks is to prepare for the tests, which are 70% of your grade.

Problems just for practice: Ch. 1 #3, 4, 6, 8, 10, 12; Ch. 2 #3, 6, 8, 10.

Problems to be turned in: Ch. 1 #5, 7; Ch. 2 #5.

Computer Problems. Some of these we will do in class (in the computer lab); others we will start but not finish in class–you will probably have to finish these on your own time.

The purpose of this assignment is twofold: first, to become more familiar with Ordinary Least Squares and what it does, and second, to become comfortable accessing economic data on the Internet and using it in a regression.

All problems on this assignment should be executed in an Excel spreadsheet and saved on a floppy disk which has your name on it and turned in by the due date listed on the calendar. The file name for each problem is listed in parentheses at the beginning of the question. Each part of the question should be saved on the equivalently named sheet (page) of the spreadsheet. So put part A on the first sheet (and title it Part A), part B on the second sheet (titled Part B), and so on. Answers to the "written" questions should be typed in, in complete sentence form, at the bottom of the appropriate page of the spreadsheet. Please adhere to all instructions! Have fun!

1. (Teachers) On my web site find a file named "teachers.xls" This file contains the Arlington ISD salary schedule for teachers, nurses, and librarians (also appended in hard copy). In this file:

A) Plot wages (dependent variable) vs. experience (independent variable) for teachers holding bachelor's degrees. (Use a scatterplot.) Please title both axes.

Based on the graph, make a guess at a linear formula that you can use to predict wages given experience. (Again, only for teachers with a bachelor's.) Form an additional column in your spreadsheet containing the wage estimates your formula gives you. Then plot the predicted values on the same graph that you created above.

Finally, make an additional column that contains the residuals–the difference between the value your formula predicts and the value given by the salary schedule. The SUMSQ function can be used to calculate the sum of squared residuals. Do this at the bottom of this column.

B) Use the regression tool in the Excel Analysis toolpack to estimate an OLS regression of wages on experience (for the bachelor's degree teachers only). (At UTA, the analysis toolpack has to be "added in" under Tools-Add_ins before it can be used.) Calculate the residuals and the sum of squared residuals as before. The sum of squared errors is smaller using which formula: yours or OLS? Interpret your coefficient estimates.

Then reproduce your graph for part A, except that your predicted values are now based on the OLS coefficients that you estimated. The regression tool will produce this graph automatically.

C) Do a regression of wages on schooling and experience, using all observations. Interpret the coefficients that you estimate. Are they consistent with theory? One coefficient you could have obtained directly from the salary schedule. Which one? Why? Also discuss R^2.

2. (Cars) Go to the Bureau of Economic Analysis web site (www.bea.gov) and pull down real motor vehicle output and real GDP, quarterly, from 1987 to the present. These are found in the National Income and Product Accounts.

A) Arrange this data into a spreadsheet. Plot the two variables against time. Can you identify the business cycle in the graph? (You can transfer the data from a row into a column by cutting it, then paste special–transpose.)

B) Regress motor vehicle output on GDP. Interpret the coefficient. Should it be greater or smaller than zero? Should it be greater or smaller than one? Also discuss R^2. In truth, R^2 is "too high" in this regression–can you guess why?

3. (WorldBank) Go to the World Bank web site (www.worldbank.org) and pull down the following data on thirty diverse countries of your choosing: per capita CO2 emissions, a measure of output such as GDP, and one other variable of your choice. The World Bank has a data extraction tool, called "Data Query," or "Quick Query," that puts the numbers right into an Excel spreadsheet for you.

A) Arrange this data into a spreadsheet. What is a high rate of CO2 emissions? A low rate? Also, consider the following questions, some of which are easily answered and some of which are not. Which income measure is preferred: GDP or GNI (Gross National Income, equivalent to GNP)? Which is measure is preferred: aggregate output or per capita output? Should your output measure be for the same years as your CO2 measure, or should you use the most recent data available? Give suggested answers to all these in your spreadsheet and we'll discuss them later.

B) Regress CO2 emissions on your output measure only. Interpret the coefficient. Also discuss R^2. Will other people's regressions have the same coefficients? Why or why not?

C) Regress CO2 emissions on your output measure and your other variable. Interpret the coefficients. Is the coefficient on output equal to that in part A? What has caused the difference?