ECO 4810 Senior Seminar—Dickinson

Statistical Analysis Homework

IF YOU HAVE ANY QUESTIONS, ASK ME BEFORE YOU TURN THIS IN!

STEP 1—Go to this website to find the data sets you must use for this assignment (it is on our class website also)

http://college.cengage.com/mathematics/brase/understandable_statistics/7e/students/datasets/

STEP 2—locate each of the data sets described below under "tasks" and import into Excel to perform the requested analysis. If you prefer to use a different statistical analysis program, that is fine, just let me know what you used (or it may be obvious in the output). In Excel, some tasks will be found in the "Data Analysis" menu under the "Data" tab. Other charts and graphs are found under the "Insert" tab.

STEP 3—Turn in analysis at the beginning of class on the day indicated in the Announcements. When the assigned task asks you to transfer results into your own format, that means you cannot just copy-paste results from Excel and turn that in. You will need to present those same results in tabular or graphical form as you would do in your research paper. The reason for having you do this is so that you realize that **it looks very sloppy to simply copy-paste output from a statistical program into your paper**. You can/should synthesize those results (not everything in the output needs to be shown) and present them in a standard format that one sees in research papers. So, tables should be self-explanatory, graphs should have proper titles/labeling/ etc.

- **TASKS**
    - **Scatter Plot of Data**
        - Go to "Data pairs for simple linear regression"
        - Use "Cricket Chirps Vs. Temperature" to create a Scatter plot of the data with Chirps/sec on horizontal axis and Temperature (F) on vertical axis
        - Remove all horizontal grid lines and reset the axis so that the vertical axis starts at 60 degrees and goes to 100 degrees. Reset the horizontal axis so that it starts at 10 chirps/sec and goes to 25 chirps per seconds (this resetting will spread out data and eliminate a lot of blank space in your scatterplot)

    - **Histogram Plot of Data**
        - Go to "Single variable large sample (n>=30)
        - Use "Heights of Pro Basketball Players" data to plot a histogram showing the frequency of different player heights **IN INCHES** (data come in feet, so you have to convert).
        - Re-set the bins so that the cutoffs are 65, 68, 71, 74, 77, 80, 83, 86, and more (inches). Note, this is **NOT** what will be used as a default by Excel, so you'll have to figure out how to recreate the bin cutoffs.

- o **Times Series Plot of Data**
  - ▪ Go to "Time series Data for Control Chart About Mean or for P-Charts data
  - ▪ Use "Quality Control" data on defective toys to produce a graph with # defective toys on the vertical axis and Days on the horizontal axis.

- o **T-test of means (paired data)**
  - ▪ Go to "Paired Data (dependent) Appropriate for T-tests
  - ▪ Use "Average Faculty Salary, Males Vs. Females" and use the data to report the means salary for men and mean salary for women and use a paired sample t-test to test the hypothesis that male salaries = female salaries. Use an alpha level of 5% for the test and indicate **in words** what the result of your test means.

- o **Multiple Regression**
  - ▪ Go to "Data for multiple linear regression"
  - ▪ Use "Crime" data to perform two distinct regressions
    - • 1st regression will regress reported crime rate (Y variable) on **just** the annual police funding variable (the X variable). So, this is a simple linear regression.
    - • 2nd regression is to regress reported crime rate (Y variable) on **all six** of the variables included in the data set.
    - • Report the results of the two regressions **together** in an appropriate Table (see published Econ papers for examples of what such a table might look like).
    - • Include a brief interpretation of the regression results.

So, you have five data analysis tasks to complete. Your results should be sized to fit on the front and back of one sheet of paper (e.g., do first three tasks on front side, and save last two tasks for back side).