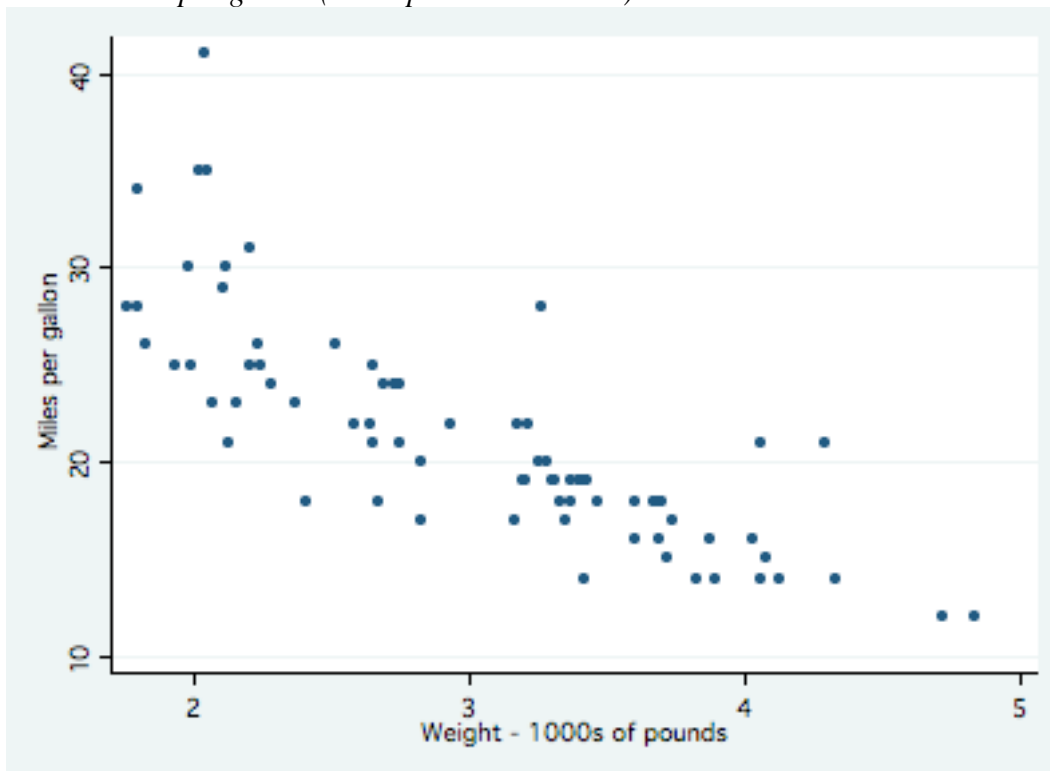


**Homework #6 (Regression)**  
**POS 3713 - Spring 2007 (Dr. Hensel)**

This homework assignment is due at the beginning of class (i.e., before lecture starts) on **Thursday, April 19**. Any work turned in after lecture begins that day (even if only a few minutes into class) will be assessed a late penalty. Also, note that all work must be your own -- students found to have copied their answers from other students (or to have had their answers copied by other students) will receive automatic zero grades on this assignment, and may face further disciplinary action.

Be sure to show your work wherever relevant; correct answers that do not show their work will only receive half credit.

*The first five questions involve the following analysis of the weight of various car models (the independent variable) and their miles per gallon (the dependent variable):*



**$N = 74$ ;  $\sum X = 223.44$ ;  $\sum Y = 1576$ ;  $\sum X^2 = 718.76$ ;  $\sum Y^2 = 36,008$ ;  $\sum XY = 4493.72$**   
**Means:  $X$  (weight) = 3.02,  $Y$  (MPG) = 21.30**

1. Based on the results of this scatterplot, what can you say about the apparent strength and direction of the relationship between these variables?
2. Calculate the regression slope for the relationship between these variables.
3. Interpret the meaning of this slope coefficient.
4. Calculate the regression intercept for this relationship.
5. Interpret the meaning of this intercept.

The next three questions involve the following result that is based on part of the class survey. The dependent variable in this regression analysis was Net (number of hours of Internet usage in the typical day). The independent variable was TV (number of hours of TV watching in the typical day). The bivariate regression results are as follows:

Variable:	Coefficient (S.E.)	t-ratio (p-value)	N = 57
Intercept	3.46 (0.40)	8.65 (0.001)	F (1,55) = 4.01 (p=.048)
TV	- 0.33 (0.15)	2.20 (0.048)	r <sup>2</sup> = 0.27

6. Using these results, write out the regression equation for this model, being sure to indicate the appropriate variable names and coefficient values in this equation.

7. How much Internet usage per day would this model predict for a student who watches no TV at all?

8. How much Internet usage per day would this model predict for a student with the maximum TV viewing habits reported in the survey (6.5 hours per day)?

The remaining questions involve a basic analysis using data from the 2000 International Social Science Survey Program (ISSP), which is included on the CD that came with the FNLG book (and is also available from the online syllabus for the course). You will analyze this data using SPSS statistical software.

9. Run a regression analysis of Education (years of education) based on Age.

To do this, once you have opened the needed data set, go to the **Analyze** pulldown menu, select **Regression**, and select **Linear** from the submenu. Select "Education I: years in school" for the dependent variable and "Age" for the independent variable. Using the Statistics button at the bottom of the screen, make sure that "Model Fit" and "Estimates" are selected, and press OK to run the model.

Be sure to copy and paste the output into your homework, or else print out the output in the computing lab and attach it to your homework when you hand it in.

10. Interpret the coefficient for Age, using the result in the Unstandardized Coefficients column of the output.

### SPSS Instructions

- The assignment sheet for homework #4 lists the relevant sections of each chapter in the FNLG book that explain how to use SPSS for courses like this. If you no longer have that assignment sheet, it is still available from the online syllabus for this course.
- The online syllabus also includes links to a number of online SPSS tutorials, each of which might be able to help you if you have any problems using SPSS for this assignment.