Homework 1

1. In order to investigate the feasibility of starting a Sunday edition for a large metropolitan newspaper, information was obtained from a sample of 34 newspapers concerning their daily and Sunday circulations (in thousands) (source: *Gale Directory of Publications, 1994*). Here is the data set:

Newspaper	Daily	Sunday
Baltimore Sun	391.952	488.506
Boston Globe	516.981	798.298
Boston Herald	355.628	235.084
Charlotte Observer	238.555	299.451
Chicago Sun Times	537.780	559.093
Chicago Tribune	733.775	1133.249
Cincinnati Enquirer	198.832	348.744
Denver Post	252.624	417.779
Des Moines Register	206.204	344.522
Hartford Courant	231.177	323.084
Houston Chronicle	449.755	620.752
Kansas City Star	288.571	423.305
Los Angeles Daily News	185.736	202.614
Los Angeles Times	1164.388	1531.527
Miami Herald	444.581	553.479
Minneapolis Star Tribune	412.871	685.975
New Orleans Times-Picayune	272.280	324.241
New York Daily News	781.796	983.240
New York Times	1209.225	1762.015
Newsday	825.512	960.308
Omaha World Herald	223.748	284.611
Orange County Register	354.843	407.760
Philadelphia Inquirer	515.523	982.663
Pittsburgh Press	220.465	557.000
Portland Oregonian	337.672	440.923
Providence Journal-Bulletin	197.120	268.060
Rochester Democrat & Chronicle	133.239	262.048
Rocky Mountain News	374.009	432.502
Sacramento Bee	273.844	338.355
San Francisco Chronicle	570.364	704.322
St. Louis Post-Dispatch	391.286	585.681
St. Paul Pioneer Press	201.860	267.781
Tampa Tribune	321.626	408.343
Washington Post	838.902	1165.567

This data set is available as the files `newscirc.***` at the class web site at `http://people.stern.nyu.edu/jsimonof/classes/2301/`. They are also available on the x drive (`x:\sor\jsimonof\2301`). Please note that for this homework (only), I am **only** asking you to answer these questions; no further analysis, transformation, etc., is necessary.

(a) Draw a scatter plot of Sunday circulation (vertical axis) versus Daily circulation (horizontal axis). Does the plot indicate that there is a linear relationship between Daily and Sunday circulation? Why might you have thought that there could be such a relationship before looking at the data?

(b) Fit a regression predicting Sunday circulation from Daily circulation.

(c) Obtain 95% confidence intervals for β_0 and β_1.

(d) Is Daily circulation significantly related to Sunday circulation? Carefully state the hypotheses you are testing here, and the test you are using.

(e) What proportion of the variability in Sunday circulation is accounted for by Daily circulation?

(f) Provide an interval estimate (based on a 95% level) for the true average Sunday circulation of newspapers with a Daily circulation of 600,000.

(g) The particular newspaper that is being considered as a candidate for a Sunday edition has a Daily circulation of 600,000. Provide an interval estimate for the predicted Sunday circulation of this newspaper. How does this interval compare to the interval in part (f)? From an intuitive point of view, why is this what you would expect?

(h) Another newspaper being considered as a candidate for a Sunday edition has a Daily circulation of 2,500,000. Provide an interval estimate for the predicted Sunday circulation of this newspaper. How does this interval compare to the interval in part (g)? Why is this what you would expect?

Note: This homework is not being collected, but all further homeworks should follow a few basic rules of style. Submit homework on 8.5" by 11" paper only. All sheets, including computer output, should be this size. Raw computer output is never acceptable; it is up to you to point out which aspects of the computer output that you submit are relevant and to demonstrate that they constitute a solution to the problem. Do **not** scrawl answers on computer output; your answers should constitute a stand–alone report, with output being referred to as necessary ("cut and paste" of the output, either literally or electronically, is encouraged). **Please** feel free to edit the output so that unnecessary printout is removed. You should word process your report.