# Quantitative Methods II
# Assignment 7
### October 9, 2011

This is the sixth (although, numbered seventh) homework assignment for the course. Its purpose is to continue increasing your proficiency in producing presentation-worthy graphics.

Graphics are very important to an article, as they convey a story in the fewest possible words. A good graph slows down the "skimmers" so that they will actually read what you write about the graph. Look around and you will see that graphs are metaphorically everywhere. USA Today made a name for itself because of its attention to graphs.

This assignment covers prediction graphs.

<p align="center">⋆ ⋆ ⋆</p>

When you hand in this assignment, you will email to me *one* file: your R script that creates the two graphics. That is it. I will run the script (as-is) when I get it and print the two graphs. That means that the file must run without modifications. That also means you need to read the data from the Internet (I will not have the file stored locally).

Why am I having you do it this way? Script files are smaller than image files. They are also easier to modify — to meet the needs of your collaborators — for inclusion in research reports and other documentation.

As always, the email needs to include the subject line:

<p align="center"><code>POLS6123: Assignment 7</code></p>

Not as always, the file you send to me will be

<p align="center"><code>lastname.R</code></p>

for whatever your last name is.

PROBLEM: GDP PER CAPITA, AGAIN                                              ⟦10⟧

During class on October 4, 2011, I created a script that read in the `gdpcap` data file, modeled the GDP per capita of a State using the level of honesty in government in the State and the governmental type. The research model I used was

$$\texttt{gdpcap} \sim \texttt{hig} \star \texttt{govt}$$

But, there was something wrong with what I did. Because the GDP per capita is bounded below by 0, I should have used a logarithm transform. That is, my research model should have been

$$\texttt{log(gdpcap)} \sim \texttt{hig} \star \texttt{govt}$$

Make the change. Model the GDP per capita using the level of honesty in government and the government type. Decide whether they should enter with an additive effect or an interaction effect.

Now, plot the data (y-variable is `gdpcap` and x-variable is `hig`). Create prediction lines (curves) for each of the three government types (remember to back-transform your predictions). Also, remember to put a legend on it.
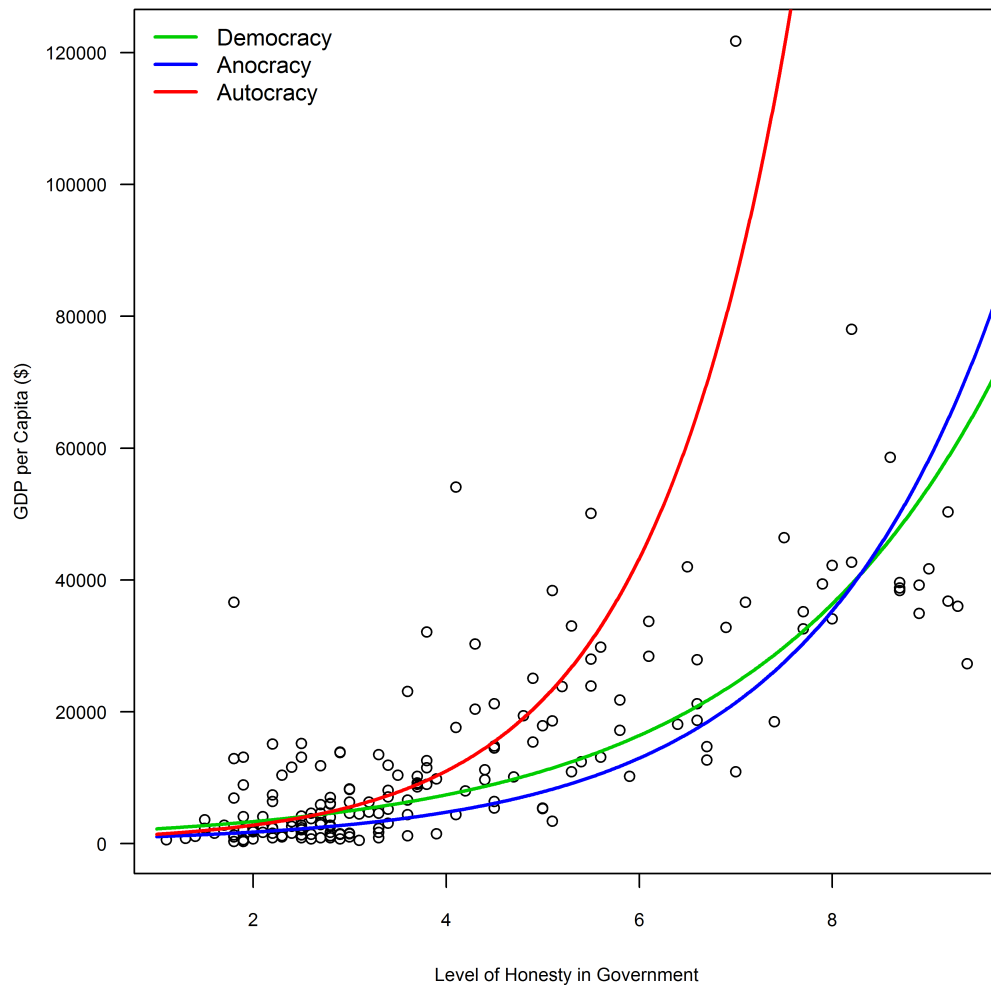
In fact, your plot should look exactly like the figure on the next page. Well, except that your size may differ.

⋆⋆⋆

**Hint**: You will need to extend the margins to the left:

```
par(mar=c(5,5,1,1))
```

which needs to go before the plot statement. Also, you will need to use a spacing character (\n) in the y-label parameter in the plot statement:

```
ylab="GDP per Capita ($)\n"
```

## Problem: More SSM                                              ⟦15⟧

Back to the `SSM2` data file. You have already modeled and predicted the proportion of the vote in favor of these types of ballot measures in Washington. We decided that the best research model (subject to my constraints) was

$$\texttt{propFavor} \sim \texttt{south} * \texttt{povertyRate}$$

Well, not quite: We have to transform the dependent variable.

So, once again model the dependent variable using the above research model (transformed appropriately). Plot the data and produce two prediction curves: one for Southern states and one for Non-Southern states. Make the line for the Southern states red, and the line for the Non-Southern states blue. Make sure you label your axes and provide an appropriate legend.

PROBLEM: EXTRA CREDIT                                              〚+5〛

Return to the GDP per capita problem above. Make the graph look like the one at the
bottom. Note that the points are colored according to their government type. Also note
that the legend is slightly different.

★ ★ ★

**Hint**: `[govt=="Democracy"]`, and its ilk, may be helpful if placed in the right places.