**Independent Practice**

Instructions: Submit this lab report to BlackBoard by 5PM on November 14. You should upload two files: one MS Word file with answers, and a Stata .do with replication code. In particular, questions must be properly numbered, and include graphs or tables as appropriate. Don't forget to include identifying information (Name, PUID, Section). The total possible point for this report is 10.

**Q1. A political scientist argues that the more gun dealers there are in a state, the less popular Obama is in the state. [use "gun\_dealer" and "Obama2012"]**

(1) Provide a scatter plot. Is the relationship positive or negative? [marker color: gold, marker shape:circle\_hollow, graph region: white] (1pt)

(2) Provide the correlation matrix and fill in the blanks. (1pt)

Pearson correlation coefficient between "Obama2012" and "gun\_dealer" is [ ]. According to the correlation coefficient, as the number of gun dealers per 100,000 population increases, the percentage of vote that Obama got in 2012 [increases / decreases]. Thus the relationship is [positive / negative]. According to the p-value, the correlation [is / is not] significantly different from zero.

(3) Provide a possible causal mechanism that supports this expectation. (1pt)

(4) Run a simple linear regression using Obama2012 as the dependent variable and gun\_dealer as the independent variable. Then, fill in the blanks. (2pt)

The effect of [Obama2012 / gun\_dealer] on [Obama2012 / gun\_dealer] is [ ] which is statistically [significant / insignificant] because the p-value is [greater / smaller] than 0.05. Thus we [could / fail to] reject the null hypothesis at the 95% confidence level. This result shows that the relationship between "Obama2012" and "gun\_dealer" is [positive / negative]. In addition, the result suggests that Obama can expect [ ]% point more support from a state that increases the number of gun dealers from 1000 to 1010. The R-square is [ ] which indicates that [ ]% of total variation in support for Obama is explained by this model.

(5) Another political scientist claims that as the number of female legislators in a state increases, Obama’s popularity in the state increases. Provide the correlation results and fill in the blanks. [use "womleg\_2011" and "Obama2012"] (1pt)

The Pearson correlation coefficient is [ ]. According to the correlation coefficient, as the number of female legislators increases, the percentage of vote that Obama got in 2012 [increases / decreases]. Thus the relationship is [positive / negative] and [stronger / weaker] than the relationship between "Obama2012" and "gun\_dealer".

(6) Provide the possible causal mechanism that supports this finding. (1pt)

(7) Run a simple linear regression and fill in the blanks. (2pt)

The regression coefficient for [Obama2012 /womleg\_2011] is [ ] which is statistically [significant / insignificant] as the p-value is [greater / smaller] than 0.05. Thus we [could / fail to] reject the null hypothesis at the 95% confidence level. This result shows that the relationship between "Obama2012" and "womleg\_2011" is [positive / negative]. In addition, the result suggests that Obama can expect [ ]% point more support from a state with 31% female legislators than a state with 30% female legislators.. The R-square is [ ] which indicates that [ ]% of total variations are explained by this model.

(8) Provide a scatter plot with a linear prediction line. (1pt)
[marker color: gold, marker shape: diamond\_hollow, graph region: white, line color: green, line pattern: solid, line width: thick, ytitle: "Obama Voting Rate in 2012", xtitle: "% of Female Legislators", title: "Female Legislators and Supports on Obama"]