**ASSIGNMENT: STATISTICAL INFERENCES IN BIVARIATE AND MULTIPLE REGRESSION**

1. Use Stata and the Electoral College data to estimate the separate bivariate regressions of vote outcome on GNP change and presidential approval. Use the OLS estimates (along with other appropriate summary statistics) to carry out the following tasks:

   Confirm that the standard error that Stata reports for the slope coefficient on GNP change is identical to the one that can be calculated using the formula for the estimated standard error, $S_e / \sqrt{\sum (X_i - \bar{X})^2}$.

   Test the original hypotheses that were stated about the effects of GNP change and about presidential popularity. Should you use directional or non-directional tests? Why or why not?

   Construct and interpret 95% confidence intervals for the intercept and slope in the equation for GNP change.

2. Use Stata and the Electoral College data to estimate the multiple regression equation of vote outcome on GNP change and presidential approval. Use the OLS estimates to answer the following questions:

   Test the statistical significance of the overall equation. Be sure to interpret the results verbally.

   Confirm that the standard error that Stata reports for the slope coefficient on GNP change is identical to the one that can be calculated using the formula for the estimated standard error in a multiple regression equation, $S_e / \sqrt{\sum (X_{ji} - \bar{X}_j)^2 (1 - R^2_j)}$.

   Someone asserts that GNP change has a positive impact on Electoral College vote outcomes even after presidential approval is taken into account. Set up the appropriate statistical hypotheses for testing this assertion. Carry out the test (use the 0.05 level) and interpret the results. Repeat the test, using the 0.01 significance level. Does anything change? Explain.

   Test the hypothesis that the multiple regression coefficient for presidential approval is identical to the value obtained in the bivariate regression. Use the 0.05 level and interpret the results of the test.

   Construct and interpret a 99% confidence interval for the coefficient on the presidential approval variable.

3. What does it mean to say that a given regression coefficient (say, the OLS coefficient for presidential approval in the multiple regression equation) is “statistically significant”?

4. Based upon the empirical evidence, which of the independent variables has the strongest effect on Electoral College vote outcomes? Be sure to explain your answer.