Project Assignment II

BMBA 5011 Spring 2015

Answer the following questions about your data:

1. Using regression analysis, (i.e. do not use the forecast function in Excel) forecast the *average annual* consumption of natural gas for each group in 2014. That is, how much natural gas is consumed during an average month? How confident would you be in concluding the coefficient estimates are not equal to zero? Why? How do you know? Interpret the coefficient estimates.

2. Using regression analysis, forecast the monthly consumption of natural gas for commercial consumers in 2013 using the data from 1989-2012. How confident would you be in concluding the coefficient estimates are not equal to zero? Why? How do you know? Interpret the coefficient estimates

3. Compare the forecasted values in 2 to the actual 2013 values for commercial consumers. See the hint below for how to do this. How confident would you be in concluding the coefficient estimates are not equal to zero? Why? How do you know? Discuss these results in terms of the accuracy of your forecast.

4. Estimate the demand for natural gas by each group over the entire period using a simple linear regression.How confident would you be in concluding the coefficient estimates are not equal to zero? Why? How do you know? Interpret the estimated coefficients. Are the signs of the estimated coefficients as you would expect?

Note: The data you have are in nominal terms! You must deflate the price values before running the demand estimations. See the hint below for how to do this.

5. Improve your estimate of demand for residential consumers by finding and including in your analysis other data that will help estimate the demand for natural gas. Recall the determinants of demand. Describe the additional data you included and note where you obtained it. How confident would you be in concluding the coefficient estimates are not equal to zero? Why? How do you know? Interpret the estimated coefficients. Are the signs of the estimated coefficients as you would expect?

6. Write a summary paragraph(s) describing this project. This part will be graded only on style. For example, describe what the project involved, what you found out about prices and consumption of natural gas in your state, what you learned about the accuracy of forecasting, etc.

The report you turn in should include the regression outputs and the output from the t-tests in 3 along with answers to all the questions.

The project is due **before the start of class** on April 16, 2015. **No exceptions**!!!

Hints

To answer the question as to whether or not your forecasted values are significantly different than the actual values for 2013, you need to compute t-statistics and determine the significance levels.  
  
t = (Forecasted Value - Actual Value)/Standard Error  
  
The standard error will be given in your regression output, labeled “Standard Error” in the Regression Statistics section. To determine the significance level of the t-tests, use the Excel function T.DIST.2T. Its form is T.DIST.2T(x, df) where x is the t-statistic, and df is the degrees of freedom which is equal to the number of observations minus 1.

Go to <http://research.stlouisfed.org/fred2/series/CPALTT01USM661S>

That should produce a graph of the CPI data over the years.  Below the graph you will see several tabs:  Notes, Graph, Share, Export.  Click on Export and then click on Download as XLS.  That will give you a spreadsheet with the CPI numbers you can use to convert the nominal prices into constant prices.

Remember, to compute the “real” or constant price in each month, follow the following formula:  
  
PriceConstant = Pricei /CPIi  where i is the current month/year value that you are adjusting.