In-Class Team Project 2

ECO391

Name Your Team: _____

Team Members:

The Data Tab of the Modules section in the Course Website on Canvas contains a data set called Chapter 15 Home_Values; this project would require you to extract that data set and use it for regression analysis.

You have data on average market home value (Home Value in $) for 51 states across the US, including District of Columbia and corresponding data on average household income (HH Inc in $), per capita income (Per Cap Inc in $), and percentage of homes occupied by owners (Pct Owner Occ in %) for the 51 states.

Imagine you are a real estate analyst, and you are trying to predict average market home values using the following regression **model**:

$$HomeValues = \beta_0 + \beta_1\, HHInc + \beta_2\, PerCapInc + \beta_3\, PctOwnerOcc + \epsilon$$

Now use Excel to run OLS/regression on the regression model (Model 1) above.

1. Write down the sample regression equation using the intercept and slope coefficient values in the regression output.

2. Interpret the coefficient on $PctOwnerOcc$, in words.

3. Report the R^2 and Adj- R^2, and interpret it.

4. Explain, in a few sentences, what multicollinearity means.

   What is the difference between “perfect multicollinearity” and “some multicollinearity”?

5. Explain the three ways you can check for multicollinearity in a model.

Using Excel, compute the correlations between the three explanatory variables in this model.

Hint: Data>Data Analysis>Correlation>Select Data>Click OK

6. Report the correlations between the variables.
   CORR($HHInc$, $PerCapInc$) =
   CORR($HHInc$, $PctOwnerOcc$) =
   CORR($PerCapInc$, $PctOwnerOcc$) =

7. Which of the coefficients is not individually statistically significant at the 5% significance level? Show your work.

8. Is there multicollinearity in the model? How can you tell? [Hint: which of the three ways you mentioned in (5) apply here]

9. Explain briefly the three ways you could get weaken multicollinearity? [Hint: Remedies of multicollinearity]

10. Which **one** of the three ways you mentioned in (9) can you use here to weaken multicollinearity given time, data, and knowledge limitations?

Estimate another regression model (Model 2) correcting for the remedy that you mentioned in (10).

11. Write down the regression model.

12. Write down the sample regression equation using the intercept and slope coefficient values in the new regression output.

13. Are all the slope coefficients in your new sample regression equation individually statistically significant at the 5% significance level? Show your work.

14. Conduct a test of joint significance to examine if all the explanatory variables together can predict Home Value at the 5% significance level.

15. Report the R^2 and Adj- R^2 for the new regression equation.

16. Should we use R^2 or Adj- R^2 to compare between the two models? Why?

17. Which model is better? How can you tell?