**Chapter 7.7 Excel Instructions**

Use the **reynolds.xlsx** file in the Chapter 7 folder of the Student Data files.

Create a Scatter Chart of the data

**Do you notice anything about the shape of the data? Why might this be the case?**

Use Excel’s Regression tool to estimate the multiple regression model

1. Click the **Data** tab in the Ribbon
2. Click **Data Analysis** in the **Analysis** Group
3. Select **Regression** from the list of **Analysis Tools** in the **Data Analysis** tools box and click **OK**
4. When the **Regression** dialog box appears
   1. Enter B1:B16 in the **Input Y Range:** box
   2. Enter A1:A16 in the **Input X Range:** box
   3. Select **Labels**
   4. Select **Confidence Level:**
   5. Select **New Worksheet Ply:**
   6. Click **OK**

**Is the relationship significant? What is the R squared? Is it a good fit?**

Use Excel’s Regression tool to estimate the NON-LINEAR multiple regression model

1. Create a new column in between Months Employed and Scales Sold
2. Call this column “Months Squared”
3. Fill the column with squared values that are in Months Employed
4. Click the **Data** tab in the Ribbon
5. Click **Data Analysis** in the **Analysis** Group
6. Select **Regression** from the list of **Analysis Tools** in the **Data Analysis** tools box and click **OK**
7. When the **Regression** dialog box appears
   1. Enter C1:C16 in the **Input Y Range:** box
   2. Enter A1:B16 in the **Input X Range:** box
   3. Select **Labels**
   4. Select **Confidence Level:**
   5. Select **New Worksheet Ply:**
   6. Click **OK**
8. Add a polynomial trend line to the scatter chart

**Does a quadratic (non-linear) model fit the data better? Why?**

Check the scatter plot for Residuals vs Predicted Values

**Are there any violations? Given these results, interpret the regression results for the coefficients**

Use the **Reynolds.xlsx** file from the Student Data Files

**Estimate a Piecewise Regression Model with Excel**

1. Insert a Knot Dummy column in the place of Column A.
   1. For any number less than 90 in the Months Employed column, enter a 0 in the Knot Dummy Column
   2. For any number over 90 in the Months Employed column, enter a 1 in the Knot Dummy Column
2. Insert a Knot Dummy\*Months column in the place of Column C.
   1. Enter the Formula: “=(B2-90)\*A2”
   2. Then drag the fill handle to fill the rest of the column
3. Go to the Data tab in the ribbon and click the Data Analysis button
4. Use the “Scales Sold” column as the y variable
5. Use the “Months Employed” and the “Knot Dummy\*Months” columns as the X variables
6. Estimate the Regression

Use the **Tyler.xlsx** file from the Student Data Files

**Estimate a regression with an interaction term**

1. Create a new column called Price\*Advertising in Column C
2. Enter the Formula “=A2\*B2 in Cell 2
3. Fill the rest of the Column
4. Estimate the regression using “Sales” as the Y variable and “Price”, “Advertising”, and “Price\*Advertising” as X variables.

Use the **LargeCredit.xlsx** file from the Student Data Files

1. Go to the Training Data Sheet at the bottom of the Spreadsheet
2. Estimate a Regression of the Credit Card training data using the Data Analysis but from the Data Tab
3. Use “Annual Charges” as the y variable, and “Household Income”, “Household Size”, and “Years of Post High School Education” as X variables.
4. Now Re-run the regression using “Annual Charges” as the y variable, and “Household Income”, “Household Size”, “Years of Post High School Education” and “Number of hours per week spent watching television” as X variables.

Use the **LargeCredit.xlsx** file from the Student Data Files

1. Go to the Validation Sheet at the bottom of the Spreadsheet
2. Re-run the regressions from the previous section but now with 2000 observations instead of the 3000.