6500: 601: 802 Business Analytics and Information Strategy Lab 2: Multiple Linear Regression

Description: Butler Trucking Company is an independent trucking company in southern California. A major portion of Butler's business involves deliveries throughout its local area. To develop better work schedules, the managers want to estimate the total daily travel times for their drivers. The managers believe that the total daily travel times in hours (**Times**) are closely related to: 1. the number of miles traveled in making the daily deliveries (**Miles**), 2. the number of gallons of gasoline consumed **(GasolineConsumption)**, 3. the number of deliveries on a driving assignment **(Deliveries)**, 4. and whether or not the assignment requires the driver to travel on a congested highway **(Highway)** where 0 = did not include travel on the congested segment of the highway during afternoon rush hour and 1 = did include travel on the congested segment of the highway during afternoon rush hour.

Directions: The data are in the *Butler* file. Prepare a report for the manager of the Butler Trucking Company that shows the results of a multiple linear regression model. In your report, be sure to proceed step-by-step using the examples from the Regression lectures on Springboard and the examples in the pdf handouts as guides and include:

- all of the null and alternative hypotheses.
- correlation matrix showing the correlations between the dependent and independent variables and any relevant interpretations of the correlations (strength, multicollinearity).
- interpretations of the coefficients (the betas) of each independent variable included in your model(s). **Tip**: You will need to rerun the regression if you drop non-significant variables from your initial model.
- the value and interpretation of the coefficient(s) of determination obtained from your model(s); the values of your VIF's.
- your residual plots and indications of any violations shown in the plots.
- your findings in plain language that the Butler manager can understand.

TIPS:

1. Be thorough and use MS Equation 3.0 for symbols when needed. To access MS Equation 3.0, click Insert, Object, drop down arrow Object, select MS Equation 3.0 and the toolbar will pop up so that you can build your equation.

2. You should anticipate that your report will be longer than 2 or 3 pages. However, it should be no more than 5 pages, including JMP output (i.e. tables and figures)!! See the *Sample MLR Report* for guidance.