USING THE “FIND NORMALIZING TRANSFORMATIONS” FEATURE
(Corresponds to Section 13.2 in textbook)

This feature is a tool to help *you make decisions*. It will not “tell you the right answer.”

Considerations to take into account:

1. The values found by the software are just estimates – so it is silly to try to get too precise.
   *Example:* The software suggests exponent 0.504 for TeachTax – this is silly as an exponent, but it suggests trying exponent 0.5.
   In other words: Do *not* stop with the values the software spits out; use them as starting points in your decisions.

2. One important consideration: What exponents make sense in context?
   *Examples:*
   - Exponent 1 is the easiest to interpret.
   - “Exponent” 0 (logs) also can be interpreted (multiplicative rather than additive scale)
   - Exponent 2 makes good sense for a predictor when response is an area and the predictor is a linear measure.
   - Exponent 3 makes good sense for a predictor when response is a volume and the predictor is a linear measure.
   - Exponent \( \frac{1}{2} \) might make sense for a predictor when response is a linear measure and the predictor is an area.
   - Exponent \( \frac{1}{3} \) might make sense for a predictor when response is a linear measure and the predictor is a volume.
   - Exponent -1 may make sense when the variable is a ratio (e.g., gallons per mile instead of miles per gallon.)
   - Other exponents might make sense in particular contexts.
   - Integers or fractions of integers make more sense than other numbers.

3. Excessive detail can also lead to overfitting – remember, you just have a sample, not the population. Parsimony is always one (not the only) consideration in model building.

4. Check out possible alternatives with a Likelihood Ratio Test (LRT). (Example later.)

5. Model selection methods are fairly robust as long as predictors are linearly related – so look at the scatterplot matrix when p-values from tests are marginal.

*Exercise:* Find suitable transformations for the Big Mac data (using Big Mac, Bread, BusFare, TeachSal, and TeachTax) after seeing the example we do in class.