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 ½ might make sense for a predictor when response is a linear measure and the predictor is an area.

Exponent 1/3 might make sense for a predictor when response is a linear measure 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.