Day 1 Homework

If you don't already have access to JMP, please install a free 30-day version from here.

1. Open the JMP data table named Peel Strength. This is a 24 run I-optimal Design to investigate the impact of four factors using a full quadratic (RSM) model to determine the effects on the peel strength needed to open a packet containing a potato snack. The goal of this experiment is to determine the settings needed to achieve a peel strength of between 3 and 6 <give units>. A peel strength below 3 can result in a snack lacking freshness, whereas a peel strength above 6 can be a challenge for some consumers to open. Why do you think an I-Optimal design was chosen for this problem?

2. Click on the green triangle to the left of Scatterplot Matrix available in the top left-hand pane of the data table. What do you observe regarding the pattern of factor combinations in any two dimensions?
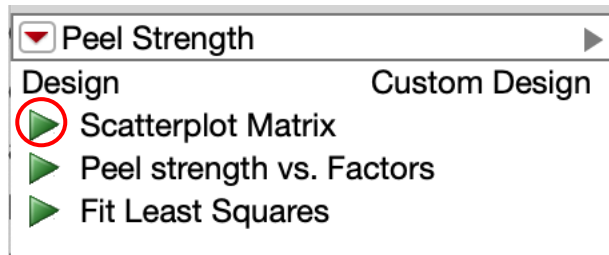
3. Click on the green triangle to the left of Peel strength vs Factors in the top left-hand pane of the data table. What trends do you observe between peel strength and each factor?

4. Click on the green triangle to the left of Fit Least Squares in the top left-hand pane of the data table. Looking at the effect summary, might it be possible to remove one or more factors from the model? If so, why might it be beneficial to leave an unimportant factor in our analysis?

5. Click on the red triangle to the left of the prediction profiler and select Optimization and Desirability to select Desirability Functions. Now click on the red triangle to the left of the prediction profiler and select Maximize Desirability. What settings of the four factors are suggested in order to get a peel strength of 4.5 (the middle of our specified range)?

6. You are informed that a single supplier cannot provide enough material for all production batches. You will need to use material from two suppliers. Which two suppliers would you recommend and why?