Practice: Fitting a Model with Interactions

Open the file **VSSTeamData.jmp** in JMP. Make sure that the five outliers for **Yield** have been hidden and excluded.

1. Fit a model for **MFI** and use all of the continuous predictors (**SA** through **Ambient Temp**) and all possible two-way interactions for these continuous predictors. The model will have six main effects and 15 two-way interaction terms.

   Which interaction is the most significant?

   The interaction between **SA** and Ambient Temp is most significant, with a p-value of 0.00286.

   To fit the model, select **Fit Model** on the **Analyze** menu. Select **MFI** as the Y variable. Select **SA** through **Ambient Temp**, and then select **Factorial to Degree** on the drop-down menu for **Macros** to add all possible main effects and two-way interactions.

2. Look at the Prediction Profiler. If you don't see the Prediction Profiler at the bottom of the Least Squares analysis window, from the top red triangle, select **Factor Profiling** and then **Profiler**.

3. The variable **SA** is involved in many significant interactions. Click and drag the vertical line for **SA** in the Prediction Profiler from the low level to the high level (but don't change any other values). As you do this, look at the slopes of the lines for the other predictors.

   What happens to the slope of **pH** as you change the value of **SA** from the low level to the high level?

   The slope of the line for **pH** changes. At low values of **SA** the slope of the line for **pH** is negative, which indicates that as **pH** increases the response, **MFI**, decreases. However, at high values of **SA**, the slope of the line for **pH** is positive, which indicates that as **pH** changes, **MFI** increases.

   The slope of each line indicates how the response changes as you change the value of the given predictor. When there is a significant two-way interaction, the effect of one predictor on the response depends on the value of the other predictor.

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