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Demo: Fitting a Multiple Logistic Regression Model

In this video, we use the Impurity Logistic example and fit a model for the response, Outcome, with the five main effects, Temp through Shift. We reduce the model and then use the Prediction Profiler to better understand the significant model coefficients.

Let's begin by selecting Fit Model on the Analyze menu.

We select Outcome as the Y variable.

Then we select Temp through Shift as the model effects. The default personality is Nominal Logistic, and the target category is Fail.

The Effect Summary table shows the terms in the model in ascending order of p-value.

Shift is not significant, so we remove it from the model. The remaining effects are significant.

Recall that the Parameter Estimates table reports the coefficients for the terms in the logistic model. To better understand these coefficients, we'll use the Prediction Profiler.

To turn on the Prediction Profiler, we select Profiler from the top red triangle.

The profiler for a categorical response shows the probability of the outcomes (on the far left) at specified values of each of the predictor variables, which are listed across the bottom.

Our logistic model predicts the probability that the outcome is Fail. Consequently, the slopes of the curves for each predictor indicate whether the probability of Fail increases or decreases.

For example, the curve for Temp increases, so as Temp increases, holding everything else constant, the probability of Fail increases.

Likewise, we can explore how the probability of Fail changes as we change the values of the other predictors.

This helps us understand the operating conditions that are most likely to lead to failures.

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