**TWO OPTIONS: NOMINAL AND ORDINAL**

**1) NOMINAL**

Overview for Nominal Logistic Regression

In MINITAB for example, use Nominal Logistic Regression to model the relationship between a set of predictors and a nominal response. A nominal response has three or more outcomes that do not have an order, such as a scratch, dent, and tear.

For example, a school administrator want to investigate the variables that affect a student's preference for certain classes. The administrator uses nominal logistic regression to determine whether a student's age and the teaching method for a class is related to class preference.

Where to find this analysis

To use nominal logistic regression, choose Stat > Regression > Nominal Logistic Regression.

When to use an alternate analysis

If your response variable has two categories, such as pass and fail, use Fit Binary Logistic Model or simply **Binary Logistic Model**.

If your response variable contains three or more categories that have a natural order, such as strongly disagree, disagree, neutral, agree, and strongly agree, use **Ordinal Logistic Regression**.

**2) ORDINAL**

Ordinal regression is a statistical method used to explore the relationship between one or more independent variables and an ordinal-level dependent variable. Let’s break down what this means:

Dependent Variable (Response):

The dependent variable (or response) in ordinal regression is ordinal. This means that it has values that exist on an arbitrary scale where only the relative ordering between different values matters.

For example, consider a survey where respondents rate a product on a scale from 1 to 5 (e.g., “very poor” to “excellent”). The ratings are ordinal because we care about the order (e.g., 1 < 2 < 3 < 4 < 5), but the specific numerical values don’t have a meaningful interpretation.

Independent Variables (Predictors):

The independent variables (or predictors) can be either categorical or continuous.

These variables influence the ordinal response.

Purpose of Ordinal Regression:

Ordinal regression helps us understand how the independent variables affect the ordering of the response categories. It’s commonly used in social sciences (e.g., modeling human preferences) and information retrieval.

Models for Ordinal Regression:

Common models for ordinal regression are:

**Ordered Logit Model**: Uses the logistic function to model cumulative probabilities of the response being at most a certain level; this is most common.

(Ordered Probit Model: Uses the probit function instead of the logistic function.

Generalized Linear Model: GLM fits both a coefficient vector and a set of thresholds to the data. The thresholds divide the real number line into segments corresponding to the response levels.)

In summary, ordinal regression bridges the gap between regression (continuous response) and classification (categorical response) by handling ordered categorical outcomes. It’s a valuable tool for understanding and predicting behavior related to ordinal variables!