CHAPTER OVERVIEW

1: Overview of ANOVA

Objectives

Upon completion of this lesson, you should be able to:

- Become familiar with the standard ANOVA basics.
- Apply the Exploratory Data Analysis (EDA) basics for ANOVA appropriate data.

In previous statistics courses analysis of variance (ANOVA) has been applied in very simple settings, mainly involving one group or factor as the explanatory variable. In this course, ANOVA models are extended to more complex situations involving several explanatory variables. The experimental design aspects are discussed as well. Even though the ANOVA methodology developed in the course is for data obtained from designed experimental settings, the same methods may be used to analyze data from observational studies as well. However, let us keep in mind that the conclusions made may not be as sound because observational studies do not satisfy the rigorous conditions that the designed experiments are subjected to.

Note!

If you aren't familiar with the difference between observational and experimental studies, you should be reviewing introductory statistical concepts which are **essential** for success in this course!

"Classic" analysis of variance (ANOVA) is a method to compare average (mean) responses to experimental manipulations in controlled environments. For example, if people who want to lose weight are randomly selected to participate in a weight-loss study, each person might be randomly assigned to a dieting group, an exercise group, and a "control" group (for which there is no intervention). The **mean** weight loss for each group is compared to every other group.

Recall that a fundamental tenet of the scientific method is that results should be reproducible. A designed experiment provides this through replication and generates data that requires the calculation of mean (average) responses.