

1. Data were collected in an effort to determine whether different dose levels of a given drug have an effect on blood pressure for people with one of three types of heart disease. To obtain this data, submit the following code:

```
drugdose <- read.csv('https://raw.githubusercontent.com/IAA-Faculty/statistical_foundations/master/drug.csv')
```

This dataset has the following variables:

- **DrugDose**: dosage level of drug (1, 2, 3, 4), corresponding to (Placebo, 50mg, 100mg, 200mg)
- **Disease**: heart disease category
- **BloodP**: change in diastolic blood pressure after 2 weeks of treatment

Perform the following analysis:

- a. Examine the data with a side by side bar chart. Put **BloodP** on the Y axis, **DrugDose** on the X axis, and stratify by **Disease**. What information can you obtain from looking at the data?
 - b. Run a 2-Way ANOVA, making sure to include an interaction term if the graphical analyses that you performed previously indicate that might be advisable (HINT: Make sure DrugDose is a factor in your model since it is stored as a number). What conclusions can you reach at this point?
 - c. If an interaction is required in the previous piece, investigate the differences in drug dose by performing a sliced ANOVA across the levels of heart disease.
2. A computer service center has four technicians who specialize in repairing three brands of computer disk drives for desktop computers. The service center wants to study the effects of the technician and brand of the disk drive on the service time. To obtain this data, submit the following code:

```
disks = read.csv('https://raw.githubusercontent.com/IAA-Faculty/statistical_foundations/master/disks.csv')
```

This dataset has the following variables:

- **Technician**: name of the technician (Angela, Bob, Justin, or Karen)
- **Brand**: brand of disk drive (1, 2, or 3)
- **Time**: time for repair (in minutes)

Perform the following analysis:

- a. Generate a 2-Way ANOVA with **Time** as the dependent variable and **Technician** and **Brand** as the independent variables (HINT: Make sure Brand is a factor in your model since it is stored as a number). Include the interaction between the independent variables in your model. Assume a level of significance of 0.05. Is the overall F test significant in your model? Is there a significant interaction?
- b. Is it appropriate to examine the tests for the main effects shown in the output?

- c. Determine whether there are differences between the technicians for each brand of disk drive using sliced ANOVA across the brands of disk drives. Also, examine the Tukey HSD among the values of **Technician** within each slice of **Brand**. What are your conclusions?