Learn By Doing #1 – One-Way ANOVA

Question 1

Choose whether the following statement is true or false.

The hypotheses that are being tested in a one-way ANOVA are:

H_o: $\mu_1 = \mu_2 = \mu_3 = \mu_4$

H_a: $\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$

TRUE

Incorrect. While the null hypothesis is correct, the alternative hypothesis isn't. Actually, it is good that you made this mistake. This is a very common mistake, but usually after making this mistake once, and understanding why, students do not repeat it. Read on for an explanation.

FALSE

Good job! Indeed, while the null hypothesis is correct, the alternative hypothesis isn't. We recommend that you read our explanation that follows even if you think you understand why the alternative hypothesis is wrong.

Note that there are many ways for μ1, μ2, μ3, μ4 not to be all equal, and μ1≠μ2≠μ3≠ μ4 is just one of them. Another way could be μ1=μ2=μ3≠ or μ1=μ2≠μ3= μ4. The alternative of the ANOVA F-test simply states that not all of the means are equal, and is not specific about the way in which they are different.