

Problem Set 2

ANOVA practice

For each of the following problems, state the null and alternate hypotheses, report the F statistic, degrees of freedom, and P value, and draw conclusions based on $\alpha = 0.05$ and $\alpha = 0.01$.

1. The file “Zar 12-1.xls” contains data from an experiment in which birds of both sexes were subjected to a hormone treatment or not, and their plasma calcium concentrations measured in mg/100ml.
 - a. Does the hormone treatment affect plasma calcium concentration?
 - b. Does sex affect plasma calcium concentration?
 - c. Is there an interactive effect between sex and hormone treatment on plasma calcium concentration?

2. The file SCflow.xls contains peak flow data for five streams in the region
 - a. Using a one-way ANOVA, determine whether the streams all have the same mean flow.
 - b. Using a two-way ANOVA to control for year, determine whether the streams all have the same mean flow. If your answer differs from part a, explain why.
 - i. You will need to convert the “Year” variable from a continuous variable to a nominal variable as described in lab.
 - ii. Note that we do not have enough degrees of freedom to look for interactions, so the analysis of interaction terms won't produce useful output. For this reason we do not use cross terms here.