Biol-4790/5090 – Biometry

Homework #3 – One-Way Analysis of Variance

For **each** problem state the null and alternate hypothesis; justify the test statistic you are using by testing all assumptions associated with the test and presenting those results in a discussion; perform the analysis and summarize result in an ANOVA table; perform the appropriate a posteriori test if needed; summarize data in graphical format. Provide a statistical, and a biological, conclusion. [**Hint:** Make sure to first figure out what kind of data you have: continuous, discrete, count, etc.]

Problem 1. Define, compare and contrast fixed vs random factors. Provide specific examples of each and why would you must take their differences into account when designing an experiment. (No need to fallow format for this question.)

Problem 2. **a**. Determine if adding different sugars to the growth media in Drosophila has an effect in the development of ocular units. **b**. Provide the mean treatment effect that each factor level has, ie, individual ⟨i's. What can you conclude from that information?

Problem 3. The Australian brown tree snake was introduced in Guam and has cause the extinction of two native birds. This snake seems to reproduce more often and less seasonally than in its native range in Australia. The data provided represents the grams of fat in the sexual segment of the kidney, which is a good indication of sperm production in males. All of the data was collected in the non-breeding. Determine if there are any differences among the populations.

Problem 4. Wood density, and to a great extent hardness, is mostly determine by the number of pores per square mm in the wood. Determine which of the three species has the greatest hardness. Which one the least?