Assignment #8 — Due May 7, 2018

1. A study was conducted to explore the effects of ethanol on sleep time. Fifteen rats were randomized to one of three treatments. Treatment 1 got only water (control). Treatment 2 got 1g of ethanol per kg of body weight, and treatment 3 got 2g/kg of ethanol. The amount of REM sleep in a 24hr period was recorded, in minutes. Data are below:

   Treatment 1: 63, 54, 69, 50, 72
   Treatment 2: 45, 60, 40, 56
   Treatment 3: 31, 40, 45, 25, 23, 28

   (a) Make a preliminary graph of the data. Why did you choose the graph that you did and what does it tell you?

   (b) State hypotheses relevant to the problem if it is desired to determine whether there are any differences in the mean sleep times for the three treatments.

   (c) Create the complete ANOVA table for this data using the formulas provided in class. Show your work. You may use R to check your answers and compute a more exact p-value.

   (d) Evaluate the ANOVA assumptions graphically. Was ANOVA appropriate here?

   (e) Based on the ANOVA table, make a conclusion in the context of the problem using $\alpha = 0.1$.

R Notes

- See the file 'Mult Ind Pops.txt' at the course website for R Code to create appropriate graphs for ANOVA, and to run ANOVAs.