Methods in Experimental Ecology II (PCB 6468)
Exam 2 – Comparing wiregrass establishment in different habitats
Due April 29, 2016

With the goal of providing information useful for pine flatwood restoration in Florida, biologists from the Lake Wales Ridge State Forest got together with UCF students and faculty to design an experiment to assess the best conditions for the reestablishment of wiregrass (*Aristida beyrichiana*). In September 2013, two-month seedlings grown in a UCF greenhouse were transplanted to four common micro-habitats (open, near palmetto, near pines, and near oaks), at two elevations (high and low), in three sites of the LWRSF. Just before being transplanted, initial maximum height and number of tillers were measured to constitute a baseline. In March 2016, we evaluated survival, and again measured the maximum height and counted number of tillers of 585 wiregrass seedlings. These data can be found in the file PCB6468_Exam2.txt.

Note 1: a lot of individuals were lost to "demonic intrusion" (a raccoon) during the first days of the experiment, they were removed from the data, leaving an unbalanced experimental design.

Note 2: initial measurements were taken independently by two groups, so the data represents an average of those two values.

Note 3: data has been simplified from field design by removing the density variable (one or three individuals planted together).

Note 4: please submit your exam as a comprehensive but single word document. Remember to include all the appropriate R code as appendices at the end, but all the relevant output as properly labelled tables and figures in the main text.

After carefully exploring the data, answer the following questions as a group:

1. Propose and justify meaningful hypothesis for the data that can relate to management and restoration in the Lake Wales Ridge State Forest.

2. Choose the most appropriate and informative models to analyze the data and present coefficient estimates, significance values and confidence intervals. Justify your selection and check for assumptions.

3. Plot your results in an informative manner; explain what the plots are showing in the text.

4. Interpret the biological and conservation significance of these results.

5. In your discussion, briefly explain other types of analyses that you considered, and why ultimately, you think they were not as appropriate for this case. Also comment on the experimental design as related to its original purpose, and suggest any changes you consider could have improved it.

100 points total