STA 290 STATISTICAL LABORATORY **HOMEWORK 3**
Fall Semester 2003

Due Thursday October 2, 2003

Exercise (1)

For the prison data from HW1, recall the following questions:

- Were the treatments effective?
- Do the treatments differ in effectiveness?
- Is treatment 1 the best?

For each question, state a statistical hypothesis regarding means (or relevant parameters) and conduct a parametric and non-parametric statistical analysis to answer each. Write a *short* paragraph for each giving the hypothesis, methods, results and interpretation. Are methods that assume normality appropriate? Do they lead to different conclusions?

Exercise (2)

To assess the degree of competition among species for nesting sites, the openings of nesting cavities (in mm^2) were measured for a variety of rodent and bird species. Biologists are interested in several questions: Are the species competing for the same size cavities? Or, are there differences in the cavity sizes selected by animals of different species? Are there differences between rodents and birds? Or does competition occur between animals of similar body sizes (i.e. Kestrel, Flicker, and Screech Owl compared to the others)? Which species have similar nesting requirements?

Carry out a statistical analysis to answer the above questions. (Data are under the Assignmements link on the course web page). Provide a one page written summary of your analysis, briefly describing the problem, methods used, results and conclusions. You may include up to two more pages of figures and tables in an appendix. Any material in the appendix must be clearly labeled and should only be included if referenced in the text of your report. Any computer output should be presented appropriately (tables or figures) with appropriate captions. If you need to perform any transformations, please give all conclusions/summaries in original units.