BUS 735: Business Decision Making and Research
Instructor: Dr. James Murray
In-class Exercise: Analysis of Variance

The quiz uses the data set `jobsat.RData` on 218 Arab and Jewish social services workers in Israel. Participants were asked background information (gender, age, marital status, education, experience, etc) and were given a set of questions to measure their overall satisfaction with their job, as well as their satisfaction specifically regarding their colleagues, supervisors, salary, and promotion.

You can download and open the data set with the following command:
`load(url('http://murraylax.org/datasets/jobsat.RData'))`

1. Estimate a one-way analysis of variance that examines differences in job satisfaction by marital status.

   (a) Report the mean level of job satisfaction for people in each marital status.

   (b) Is there a relationship between job satisfaction and marital status? Test the appropriate hypothesis. Report also the R code you used to conduct this test.

   (c) Use Bonferroni-corrected post-hoc tests to describe the differences in job satisfaction by marital status.

2. Consider the following questions regarding the *median* level of job satisfaction by location.

   (a) Report the median level of job satisfaction for public workers at each location.

   (b) Is there a relationship between median level of job satisfaction and location? Test the appropriate hypothesis. Report also the R code you used to conduct this test.

   (c) Use the function `pairwise.wilcox.test()` with Bonferroni correction to conduct post-hoc tests for differences in median satisfaction between each location. Describe where there is statistical evidence for differences.

3. Estimate a multi-way analysis of variance that examines differences in job satisfaction by education and location. Include in your analysis the possibility of an interaction effect.

   (a) Taking into account the effect of educational attainment, is there a relationship between job satisfaction and location? Test the appropriate hypothesis.

   (b) Taking into account the effect of location, is there a relationship between job satisfaction and educational attainment? Test the appropriate hypothesis.

   (c) Does the impact education has on job satisfaction depend on location? Test the appropriate hypothesis.

   (d) What percentage of the variability in job satisfaction is explained by differences in location and education?