Math 8452, Homework #5. Due on 7/1/20 (Wed section) or 7/2/20 (Thu section).

Reading from the textbook:

- Read Section 6.9 on simultaneous confidence intervals for all pairwise shifts.

- Read Sections 7.1 and 8.1 on Friedman's test and Kendall's test.

- Read Section 8.5 on Spearman's test

Problems to do:

1. (To turn in.) Using listing, find the permutation distribution of Kendall's statistic $\hat{\tau}$ and Spearman's statistic r_s for the data below. Note that there is a tie between two of the y values.

x	0	1	3	5
y	0	2	2	5

2. (Not to turn in.) Do problem 5 on page 302. Also, plot the data and comment on what you see. Finally, please compute the test statistic by hand and check your answer using the R output.

3. (To turn in.) Using the data from Table 8.10 on page 441, test the null hypothesis of independence at level 0.05 using (a) Kendall's test, (b) Spearman's test, (c) a permutation test based on Pearson's correlation coefficient, and (d) Hoeffding's test. Also, plot the data appropriately. Please use built-in R functions. Comment on how the results of the four different tests compare.

4. (To turn in.) Please turn in a paragraph describing what you plan to do for the course project. If you intend to do a data analysis, please indicate what data you plan to use. The project should involve analyzing a data set sufficiently substantial that many of our different techniques can be used. Some items to include in the final project: (i) exploratory data analysis, (ii) a discussion of the results that you obtained using nonparametric methods, (iii) a comparison of what you found using nonparametric methods and what you would have found using parametric methods, (iv) some comments on whether the parametric methods are appropriate for your data or not.

5. (Not to turn in.) Do problems 2, 4–6, and 8–10 from the sample test.