Homework 5

Due on Nov 26, 2:30pm.

Problem 1

Consider the following data:
Group1 0.7681, 0.8027, 0.2156, 0.074, 1.5076
Group2 2.9736, 0.9448, 1.6394, 0.0389, 1.2958
Group3 4.8249, 2.2516, 1.5609, 2.0452, 1.0959
We are interested in comparing whether there exists any location shift.

a) Compare your results based on the usual anova F-test, the permutation F-test, and the Kruskal-Wallis test.

b) Conduct multiple comparisons based on Bonferroni's method, Fisher's LSD and Tukey's HSD criterion.

c) Redo part (b) using rank data with permutation procedure.

d) Analyze the above data using Jonckheere-Terpstra's test.

Problem 2

Students were asked at the beginning and at the end of the course whether they agree with the statement: "Econometrics is important to my major area of study". The response is on a scale of 1 to 5, with 1 strongly disagree and 5 strongly agree. Use a paired compasion permutation test to decide whether the responses changed significantly from the beginning to the end of the semester.

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Before	2	3	4	4	3	1	3 7	4	4	5	3	4	2	2	4	3	4	2	2
After	2	4	4	4	4	4	3	5	4	4	4	5	4	2	5	5	4	1	2

Problem 3

Consider the following data, which are dry matter contents (in kg) of hay obtained from six experimental plots. The experiment was designed as a randomized complete block and the treatments are three cutting dates.

Date	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Sep 1	1.5	2.1	1.9	2.8	1.4	1.8
Sep 15	1.8	2.0	2.0	2.7	1.6	2.3
Sep 30	1.9	2.5	2.5	2.6	2.1	2.4

a) Test for differences among cutting dates using a permutation test for a randomized complete block design.

b) Analyze using ANOVA for a randomized complete block.

c) Apply Friedman's test.

d) Use Page's test to see whether the dr matter contents increase over time.