Math 663-101, Fall 2008

Quiz # 6

Name:_____

Student ID:_____

December, 9

Must show all work for full credit!
I pledge I have not violated the NJIT Honor Code_____

1. An antismoking campaign is being evaluated prior to its implementation in high schools across the state. A pilot study involving seven volunteers who smoke is conducted. Each volunteer reports the number of cigarettes smoked the day before enrolling in the study. Each is then subjected to the antismoking campaign, which involves educational material, support groups, formal programs designed to reduce smoking, etc. After four weeks, each volunteer again reports the number of cigarettes smoked the day before. Based on the following pilot data, does it appear that the program is effective?

At Enrollment:	21	15	9	7	12	15	20
After Campaign:	12	10	10	7	9	15	11

The data is integer valued and assuming the appropriate data set is normal distribution may therefore be questionable. The biostatistician is asked to run a relevant non parametric test at alpha = 0.05. (10 points)

H_0: Median # smoked at enrollment = Median # smoked after campaign

H_1: Median # smoked at enrollment > Median # smoked after campaign α=0.05

At Enrollment	After Campaign	Difference	Rank of absolute difference	Signed Rank
21	12	9	4.5	4.5
15	10	5	3	3
9	10	-1	1	-1
7	7	0		
12	9	3	2	2
15	15	0		
20	11	9	4.5	4.5

Sum of positive ranks T=14

$$Z = \frac{14 - \frac{5(5+1)}{4}}{\sqrt{\frac{5(5+1)(2(5)+1)}{24}}} = \frac{14 - 7.5}{\sqrt{13.75}} = 1.7529$$. One tailed test because of inequality (improvement due to the program) in the alternate hypothesis.

P (Z > 1.75) = 1 – 0.9599 = 0.0401. Reject H_0 because p = 0.0401 < 0.05. The program is significant effective (at alpha = 0.05).