

Friedman test

1. A graduate student performed a pilot study for his dissertation. He wanted to examine the effects of animal companionship on elderly males. He selected 10 male participants from a nursing home. Then he used an ABAB research design, where A represented a week with the absence of a cat and B represented a week with the presence of a cat. At the end of each week, he administered a 20-point survey to measure quality of life satisfaction. The survey results are presented in Table 1.

TABLE 1

Participants	Week 1	Week 2	Week 3	Week 4
1	7	6	8	9
2	9	8	10	7
3	15	18	16	17
4	7	6	8	9
5	7	8	10	11
6	10	14	13	11
7	12	19	11	13
8	7	4	2	5
9	8	7	9	5
10	12	16	14	15

Use a Friedman test to determine if one or more of the groups are significantly different. Since this is pilot study, use $\alpha = 0.10$. If a significant difference exists, use Wilcoxon signed rank tests to identify which groups are significantly different. Use the Bonferroni procedure to limit the type I error rate. Report your findings.

- 2 A physical education teacher conducted an action research project to examine a strength and conditioning program. Using 12 male participants, she measures the number of curl ups they could do in 1 min. She measured their performance before the programs. Then, she measured their performance at 1 month intervals. Table 2 presents the performance results.

TABLE 2

Number of curl ups in one minute

Participants	Baseline	Month 1	Month 2
1	66	67	69
2	49	50	56
3	51	52	49
4	65	65	69
5	42	43	46
6	38	39	40
7	33	31	39
8	41	41	44
9	46	47	48
10	45	46	46
11	36	33	34
12	51	55	67

Use a Friedman test with $\alpha = 0.05$ to determine if one or more of the groups are significantly different. The teacher is expecting performance gains, so if a significant difference exists, use one-tailed Wilcoxon signed rank tests to identify which groups are significantly different. Use the Bonferroni procedure to limit the type I error rate. Report your findings.