

Statistics 506
Test 2

1. A 3-factor design was replicated twice. Results appear in the table below.

A	B	C	Rep 1	Rep 2
-1	-1	-1	26	33
1	-1	-1	26	25
-1	1	-1	32	33
1	1	-1	26	29
-1	-1	1	22	29
1	-1	1	42	16
-1	1	1	14	23
1	1	1	44	30

- (a) Use Minitab to analyze the replicated design and construct T statistics. Which effects are significant at the .05 level? Using the significant effects, what would be the EMR if we wanted to maximize the response?
- (b) Consider the first and second replicates as separate experiments. Construct effects plots, and then compute T statistics using the approach we used in HW 4 (use the negligible effects to estimate experimental error). Which effects are significant at the .05 level? Compute p-values.
- (c) Compare results from the analyses. Are they roughly consistent?
2. An experimenter studied 6 factors in 16 runs by assigning E to ACD and F to ABC. The data appears in the table below

A	B	C	D	E	F	Response
-1	-1	-1	-1	-1	-1	116.1
1	-1	-1	-1	1	1	124.0
-1	1	-1	-1	-1	1	119.5
1	1	-1	-1	1	-1	123.3
-1	-1	1	-1	1	1	124.2
1	-1	1	-1	-1	-1	116.2
-1	1	1	-1	1	-1	119.2
1	1	1	-1	-1	1	122.2
-1	-1	-1	1	1	-1	118.4
1	-1	-1	1	-1	1	122.1
-1	1	-1	1	1	1	123.1
1	1	-1	1	-1	-1	117.2
-1	-1	1	1	-1	1	120.3
1	-1	1	1	1	-1	121.8
-1	1	1	1	-1	-1	114.3
1	1	1	1	1	1	125.3

- (a) What terms are aliased with I? What is the resolution of this design? Explain.
- (b) Analyze the data. What effects are important?
- (c) What are the 8 runs for which I=-ABD? Analyze these 8 runs. Are your results similar to what you obtained for the 16-run design?

- (d) Fold over the 8-run design and re-analyze the data. Do you recover the results from the original 16-run design?