Exam 2 for ISYE 6413 with Professor Wu at GT

No description

ISyE6413
Second Midterm - Sample Exam
(Total : 30 points)

Name :

Problem	1	2	3	4	5	Total
Max Points	4	4	6	5	11	30
Your score						

Problem 1 (4 pts) An agronomist wants to conduct a field trial to compare the yield of four tomato varieties A, B, C, D. Someone suggests to him to use the following Latin square as the experimental plan, where rows and columns represent the vertical and horizontal positions of the plot. Do you see any potential shortcomings for using this Latin square? Discuss them. Suggest another Latin square that does not suffer from these shortcomings.

A	B	C	D
D	A	B	C
C	D	A	B
B	C	D	A

Problem 2 (4 pts) Define the effect hierarchy principle. Give the definition of the minimum aberration blocking scheme. Explain why the latter can be justified by the former.

Problem 3 (6 pts) To arrange a 2^6 design in 8 blocks, someone suggests the use of the following block generators: $B_1 = 123$, $B_2 = 2345$ and $B_3 = 1456$.

(a) (3 pts) Find all the factorial effects that are confounded with the block effects (how many degrees of freedom). Based on your result, explain why this is not a desirable blocking scheme.

(b) (3 pts) Find a better block scheme (i.e., different block generators). For this new scheme, derive all the factorial effects that are confounded with the block effects. (Note: No design table is provided. You need to figure it out by a simple trial-and-error.)

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