Question 1: Fractional Factorials

⋆ Given

1. 2^{5-2}
2. 2^{8-4}
3. 2^{6}

⋆ Find

Runs per replicate needed for each of the above Fractional Factorials

⋆ Solution

Question 2: Use R to Generate Fractional Factorials

⋆ Given

1. Any 2^{5-1}
2. A 2^{8-3} with the generators F=ABC, G=ABD, H=BCD

⋆ Find

Use R and the FrF2 Package to create the above and display the +1/-1 matrices

⋆ Solution

Question 3: Aliasing

⋆ Given

1. I=ABCD=EBCD=AE
2. I=ABCDE

⋆ Find

The aliases of 'BC' in each of the above

⋆ Solution

Question 4: Resolution

⋆ Find

Explain why a R_{II} fractional experiment is a bad idea? Use an example to illustrate your point.

⋆ Solution

Question 5: Concepts of Half Fractional

⋆ Given

2^{4-1} Half Fractional Factorial Experiment with the D=ABC generator

⋆ Find

The process to create the 'other' half. Hint: D=ABC means D=+ABC

⋆ Solution

Question 6: Application

⋆ Given

You have been given authorization to study a flame-resistant material. There are 8 key factors, (A,B,C,D,E,F,G,H)

⋆ Find

1. How many samples at a minimum would you need to request to perform a Full Fractional Experiment of any use?
2. You have been authorized only 100 samples at maximum. What are the feasible Balanced Fractional Experiments you could run?
3. For each of the experiments you listed in the last part, what are the engineering trade-offs in the feasible ones?
4. Pick your choice of experiment and state issues with that experiment you would need to keep in consideration during the analysis phase.
5. Assume DE and BC are significant and critical two way interactions, use the FrF2 package to determine generators for your choice above to address these.

⋆ Solution

END OF ASSIGNMENT