Week 16

Tuesday

$k + 2k$ designs.

HU: Don't need to do 8.8 + 8.22 (due Dec 10)

\[ A^+ 1, A^+ 9 \]
\[ B^+ 1, B^+ 8 \]
\[ C^+ 9, C^+ 7 \]
\[ D^+ 2, D^+ 5 \]

Source df: ABC 1

<table>
<thead>
<tr>
<th>ABC/BLOCK</th>
<th>ABC</th>
<th>ABB</th>
<th>ACB</th>
<th>BCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
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</table>

Source df: 4

<table>
<thead>
<tr>
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<th>ABC</th>
<th>ABB</th>
<th>ACB</th>
<th>BCB</th>
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Options:

1) Normality plot
2) pool interactions into error.

Begin experiment with Block 1. However, budget cut for R = b.

Run Block 1, what to do?

Can get some terms, but only 8-1 df.

So what can we get? Determined by confounding pattern.
\[ I = ABCD \text{ called "Identity" } \]
\[ \overline{A} = A : AB = b : c : AB = A^3 = C \]
\[ \overline{B} = AB : A = A^\prime : B = b \]
\[ \overline{C} = AC : A = A^\prime : C = c \]
\[ \overline{D} = AD : A = A^\prime : D = d \]

**ANOVA**

- 1) Normality plots of effects
- 2) Pull interactions into error

**Fractional Factorial 2 \(-2\)**

- Generate design
- \[ I = ABCDE = ABCDE = ABCDE = E \]
- \[ A = BCE = ABC = ABDE = E \]
- \[ B = ACDE = ABC = ADE = E \]
- \[ C = ABDE = ABC = ADE = E \]
- \[ D = ACDE = ABC = ADE = E \]

- All levels coded as \( \pm 1 \)
- All factors quantitative
- In design \( A = 1 \) is operating spec.
- \( A = 1 \) high spec.
- In this case can run regression model.
- Any \( 2^{k-p} \) can be analyzed via linear regression.

If want quadratic terms, must have more levels.
Usually start with a center point.
\[ 2^{k-1} \]
\[ (0,0,0,0) \text{ center point} \]