

Weekly Meeting

Topic: Need A with resolution IV

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Issues

1. Property α with design A having resolution IV .
2. Property β with design A having resolution IV .

Property α

$\text{SOA}(n, m, 27, 3)$ has property α iff:

1. A is resolution IV .
2. (B, B', B'') is resolution III , i.e., no repeated columns.

Property β

SOA($n, m, 27, 3$) has property β iff:

1. A is resolution IV .
2. $(B, B', B'') \subseteq \bar{A}$.
3. (B, B', B'') contains no 2 factor interaction from A .

Property α for $k = 4$

α	β	$\alpha \cdot \beta$	$\alpha \cdot \beta^2$
14	23	1234	12^23^24
1^24	2^23	1^22^234	1^223^24
24	1^23	1^2234	123^24
2^24	13	12^234	$1^22^23^24$
123	12^24	1^234	2^234^2
1^22^23	1^224	134	234^2
12^23	1^22^24	234	1^234^2
1^223	124	2^234	134^2

Property α for $k = 4$

This construction gives D with 8 factors (8/10).

Property α for $k = 6$

α	β	$\alpha \cdot \beta$	$\alpha \cdot \beta^2$
$5 \cdot A_{(1)}$	$6 \cdot B_{(1)}$	$56 \cdot A_{(1)}B_{(1)}$	$56^2 \cdot A_{(1)}B_{(1)}^2$
$5^2 \cdot A_{(1)}$	$6^2 \cdot B_{(1)}$	$5^2 6^2 \cdot A_{(1)}B_{(1)}$	$5^2 6 \cdot A_{(1)}B_{(1)}^2$
$6 \cdot A_{(1)}$	$5^2 \cdot B_{(1)}$	$5^2 6 \cdot A_{(1)}B_{(1)}$	$56 \cdot A_{(1)}B_{(1)}^2$
$6^2 \cdot A_{(1)}$	$5 \cdot B_{(1)}$	$56^2 \cdot A_{(1)}B_{(1)}$	$5^2 6^2 \cdot A_{(1)}B_{(1)}^2$
$56 \cdot A_{(2)}$	$56^2 \cdot B_{(2)}$	$5^2 \cdot A_{(2)}B_{(2)}$	$6^2 \cdot A_{(2)}B_{(2)}^2$
$5^2 6^2 \cdot A_{(2)}$	$5^2 6 \cdot B_{(2)}$	$5 \cdot A_{(2)}B_{(2)}$	$6 \cdot A_{(2)}B_{(2)}^2$
$56^2 \cdot A_{(2)}$	$5^2 6^2 \cdot B_{(2)}$	$6 \cdot A_{(2)}B_{(2)}$	$5^2 \cdot A_{(2)}B_{(2)}^2$
$5^2 6 \cdot A_{(2)}$	$56 \cdot B_{(2)}$	$6^2 \cdot A_{(2)}B_{(2)}$	$5 \cdot A_{(2)}B_{(2)}^2$

Property α for $k = 6$

Where

$$A_{(1)} = (14, 1^2 4, 24, 2^2 4)$$

$$A_{(2)} = (123, 1^2 2^2 3, 12^2 3, 1^2 23)$$

$$B_{(1)} = (23, 2^2 3, 1^2 3, 13)$$

$$B_{(2)} = (12^2 4, 1^2 24, 1^2 2^2 4, 124)$$

This construction gives D with 32 factors (32/91).

Grouping with A not having res. IV

α	β	$\alpha \cdot \beta$	$\alpha \cdot \beta^2$
$5 \cdot A$	$6 \cdot B$	$56 \cdot AB$	$56^2 \cdot AB^2$
$5^2 \cdot A$	$6^2 \cdot B$	$5^2 6^2 \cdot AB$	$5^2 6 \cdot AB^2$
$6 \cdot A$	$5^2 \cdot B$	$5^2 6 \cdot AB$	$56 \cdot AB^2$
$6^2 \cdot A$	$5 \cdot B$	$56^2 \cdot AB$	$5^2 6^2 \cdot AB^2$
$56 \cdot A$	$56^2 \cdot B$	$5^2 \cdot AB$	$6^2 \cdot AB^2$
$5^2 6^2 \cdot A$	$5^2 6 \cdot B$	$5 \cdot AB$	$6 \cdot AB^2$
$56^2 \cdot A$	$5^2 6^2 \cdot B$	$6 \cdot AB$	$5^2 \cdot AB^2$
$5^2 6 \cdot A$	$56 \cdot B$	$6^2 \cdot AB$	$5 \cdot AB^2$

Grouping with A not having res. IV

This construction gives D with 64 factors (64/91).

Construct property β for $s = 2$

$P_0 =$ all combinations of e_3, \dots, e_k .

$$P = (I, P_0)$$

$$A = e_1 P$$

$$B = e_2 P$$

$$B' = e_1 e_2 P \rightarrow S = (P_0, A, B, B')$$

Construct property β for $s = 3$

P_0 = all combinations of e_3, \dots, e_k .

$$P = (I, P_0, P_0^2)$$

$$A = e_1 P$$

$$B = e_2 P$$

$$B' = e_1 e_2 P$$

$$B'' = e_1 e_2^2 P \rightarrow S = (P_0, A, B, B', B'')$$

However, A does not have res. *IV*. `s111` and `s211` is not satisfied.