Weekly Meeting

Topic: Issues regarding grouping and permutations

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Date: Apr 24, 2024

Issues

1. Find the permutation for $k = 2$ with group α being resolution III, so that design A would be of resolution IV.

2. How to get the grouping for $k = 6$, based on the grouping for $k = 4$.

3. Grouping for $k = 5$, or permutation for $k = 3$ if feasible.

A grouping for $k = 4$

α	β	$\alpha \cdot \beta$	$\alpha \cdot \beta^2$
13	24	1234	12^234^2
1^23	2^24	1^22^234	1^2234^2
23	1^24	1^2234	1234^2
2^23	14	12^234	$1^22^234^2$
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

Notes

The number of effects:

- $k = 2$: 4
- $k = 3$: 13 (=4x3+1)
- $k = 4$: 40 (=13x3+1)
- $k = 5$: 121
- $k = 6$: 364

Notes

Formula:

1. $\sum_{i=1}^{k} C_i^k 2^{i-1}$
2. $\frac{3^k - 1}{2}$

After meeting

This can work for $m = 8$:

α	β	$\alpha \cdot \beta$	$\alpha \cdot \beta^2$
24	13	1234	1^2234^2
2^24	1^23	1^22^234	12^234^2
1^24	23	1^2234	$1^22^234^2$
14	2^23	12^234	1234^2
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

Todos

1. Check if $m > 8$ is possible, by trying different mutiplication to the permutation.

2. Dig into the grouping algorithm when $s = 2$, and think about if it can be extended to $s = 3$.