Covering Arrays: The Basics

CSE 691 Homework # 1

1. Make a CA$(25; 2, 6, 5)$ and a CA$(49; 2, 8, 7)$ using the construction of orthogonal arrays over the finite field.

2. Uisng the solutions in question 1, make a CA$(25; 2, 5, 5)$ and a CA$(49; 2, 5, 7)$ by truncation.

3. From the CA$(25; 2, 5, 5)$ use augmentation to produce a CA$(N; 2, 5, 6)$ and determine the N that it makes.

4. From the CA$(25; 2, 5, 7)$ use fusion to produce a CA$(M; 2, 5, 6)$ and determine the M that it makes.

5. So which is smaller in this case?

6. There is a CA$(37; 2, 5, 6)$; does either method seem like it can be modified to get this?

7. There is no CA$(36; 2, 5, 6)$. In fact there is no CA$(36; 2, 4, 6)$. Why does the latter justify the former? (Of course, we have not shown the latter, and known explanations are all basically case analyses.)