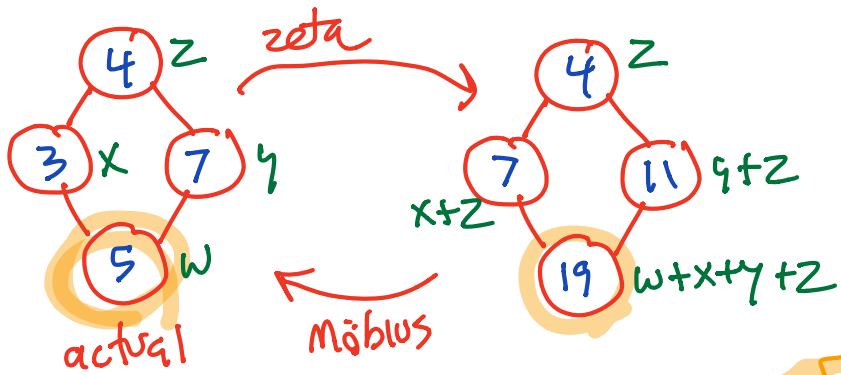


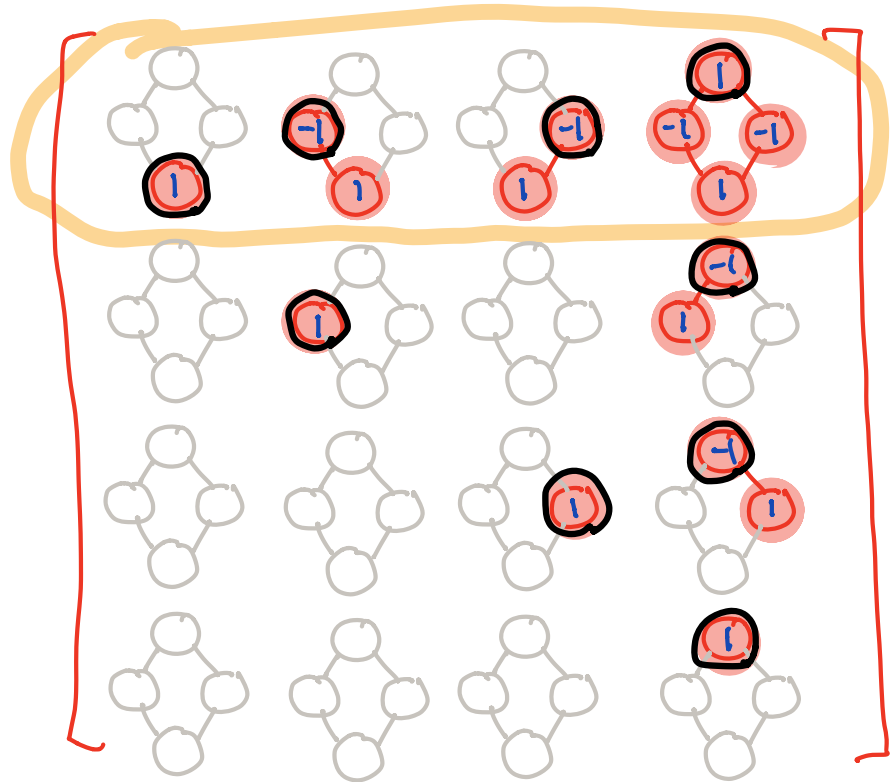
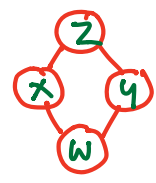
Möbius inversion function



$$\begin{bmatrix} z \\ x \\ y \\ w \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix}$$

A

$$\begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 & -1 & -1 & 1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix}$$



$$\begin{bmatrix} 1 & -1 & -1 & 1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad \checkmark$$

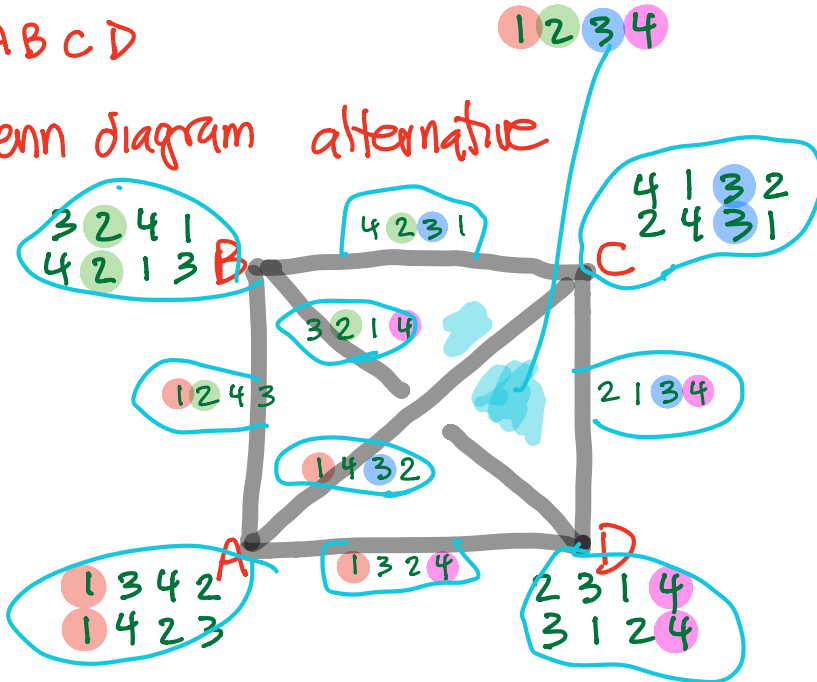
How many permutations in 1234 fix exactly 1
 ABCD

~~(ABCD)~~
 + ~~(ABC)~~ + ~~(ABD)~~ + ~~(ACD)~~ ...
 - ~~(AB)~~ - ~~(AC)~~ - ~~(AD)~~ ...
 + (A) (B) (C) (D)
 (∅)

1342
1423

ABCD

Venn diagram alternative



9

3142 3421
 2143 4312
 2341 4321
 2413 4123
 3412

