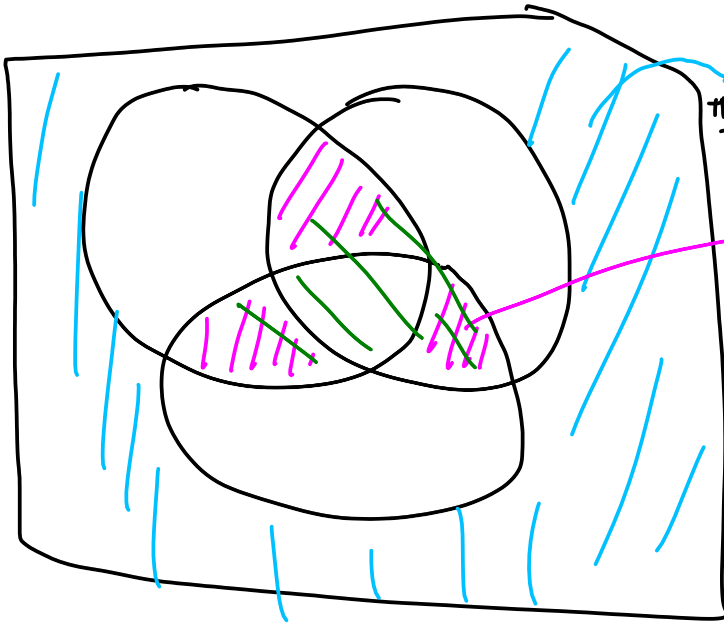
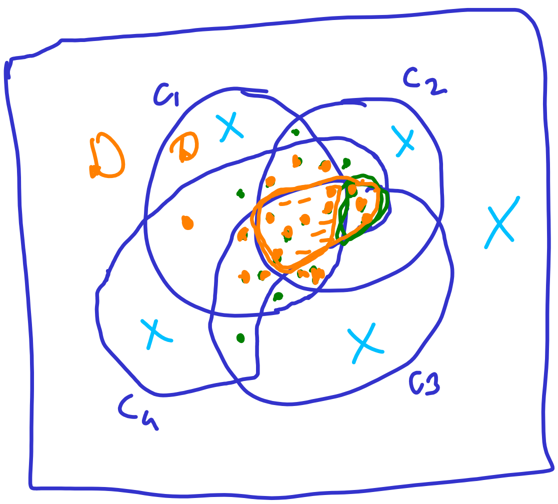


thm I.E. $\Rightarrow \bar{N}$ = none of the cond.

$\Rightarrow$ exactly m cond.

= atleast m cond.

$$\bar{N} = S_0 - S_1 + S_2 - S_3 \ldots$$



$$E_2 = S_2 - \binom{3}{2} S_3 + \binom{4}{2} S_4$$

$N(c_1 c_2 c_3 c_4)$

$c_2 \cap c_3 \cap c_4$

$c_2 c_3 \quad c_2 c_4 \quad c_3 c_4 \qquad \binom{3}{2}$

$$S_2 = \sum_{i,j} N(c_i c_j)$$

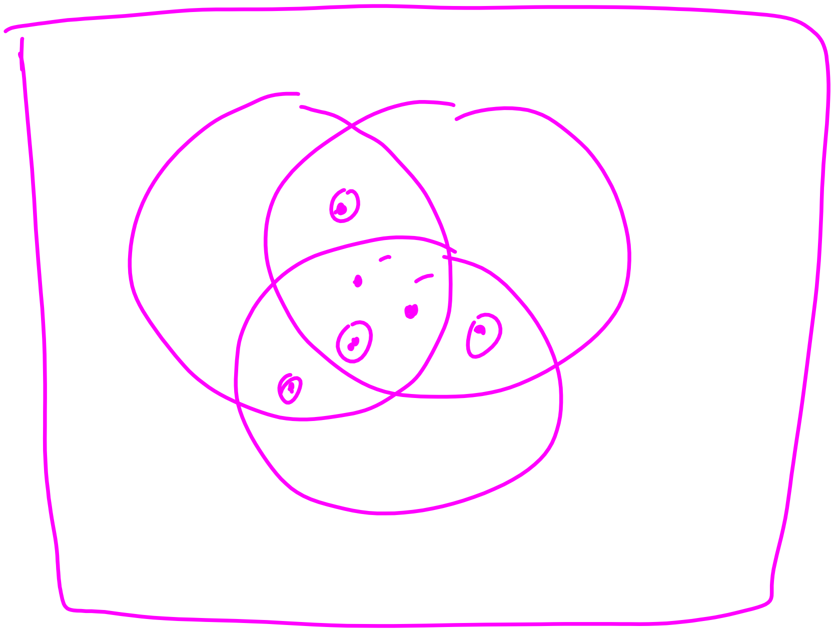
$\binom{4}{2} - 4\binom{3}{2} = \binom{4}{2}$

$6 - 12 = -6$

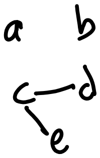
$= N(c_1 c_2) + N(c_1 c_3) \ldots \quad \ldots$

$$S_3 = \sum N(c_i c_j c_k)$$

$= N(c_1 c_2 c_3) + N(c_1 c_2 c_4) + N(c_1 c_3 c_4) + N(c_2 c_3 c_4)$



$$L_2 = S_2 - \binom{2}{1} S_3$$



 $\times 5$

$10 \times 4 = 40$

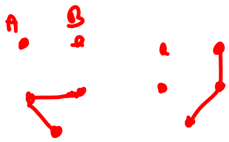
$$E_2 = S_2 - \binom{3}{2}S_3 + \binom{4}{2}S_4 - \binom{5}{2}S_5$$

$$= \binom{5}{2}2^{\binom{3}{2}} - \binom{3}{2}\binom{5}{3}2^{\binom{2}{2}} + \binom{4}{2}\binom{5}{4}1 - \binom{5}{2}\binom{5}{5}1$$

$$= 10\cdot 8 - 60 + 30 - 10 = 40$$

$S_2 = \sum_{i,j} N(c_i c_j)$

2^3 $\quad 2^1 \quad 1$



 $\times \binom{5}{2} = 40$

$\forall: 1 \le i \le 5,$

$C_i = v_i$ is isolated

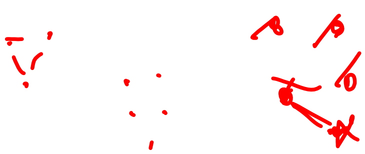
t # of cond.

$$E_2 = S_2 - \binom{3}{2}S_3 + \binom{4}{2}S_4 - \binom{5}{2}S_5$$

$$= \binom{5}{2}\cdot 2^{\binom{3}{2}} - \binom{3}{2}\binom{5}{3}2^{\binom{2}{2}} + \binom{4}{2}\binom{5}{4}1 - \binom{5}{2}\binom{5}{5}\cdot 1$$

$$= 80 - 60 + 30 - 10$$

$= 40$

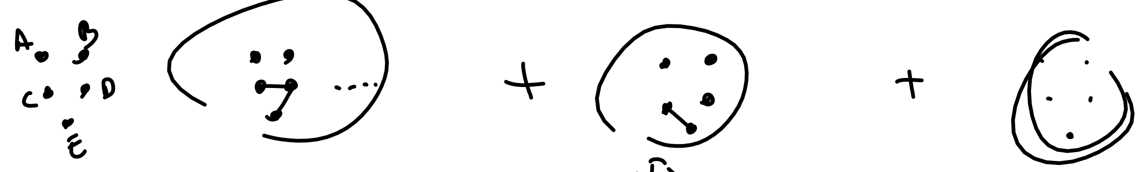


$2^{\binom{3}{2}}$

$S_2 = N(c_1 c_2) + N(c_1 c_3) \; \vdots \; N(c_4 c_5)$

$S_3 = N(c_1 c_2 c_3) \; \vdots \; N(c_3 c_4 c_5)$

$\binom{5}{3}$



$\binom{5}{3}$

$40 + 10 + 1 = 51$

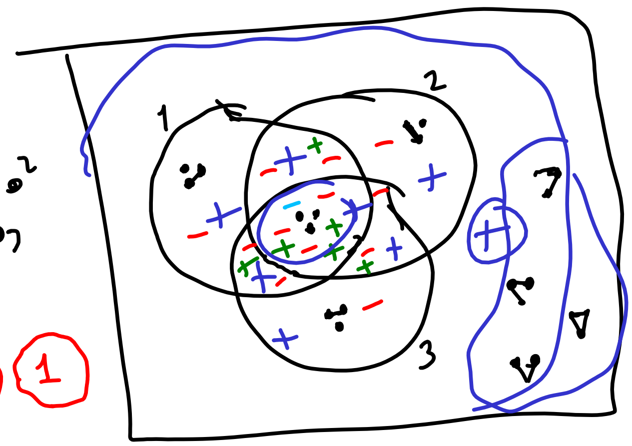
$$L_2 = S_2 - \binom{2}{1}S_3 + \binom{3}{1}S_4 - \binom{4}{1}S_5$$

$$= \binom{5}{2}2^{\binom{3}{2}} - \binom{2}{1}\binom{5}{3}2^{\binom{2}{2}} + \binom{3}{1}\binom{5}{4}\cdot 1 - \binom{4}{1}\binom{5}{5}\cdot 1$$

$$= 80 - 40 + 15 - 4$$

$$= 40 + 11 = 51$$

c_i: 1 2 3



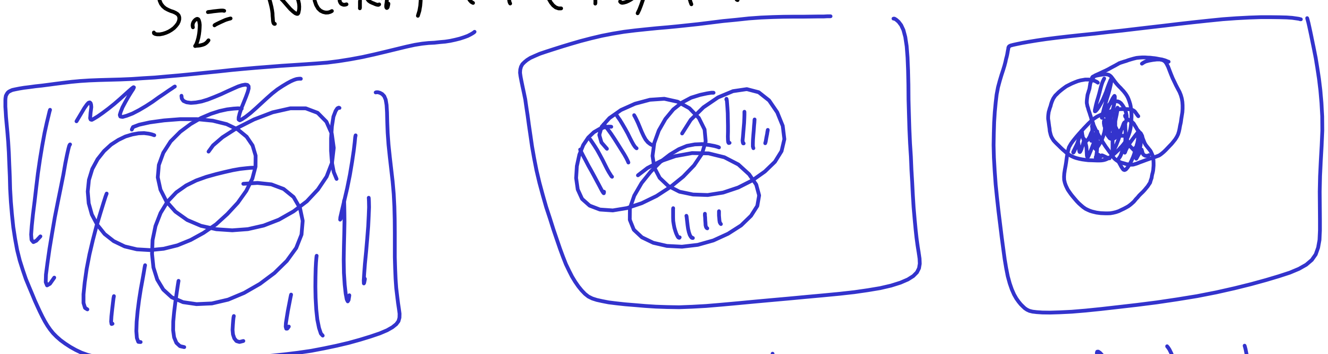
$$\bar{N} = S_0 - S_1 + S_2 - S_3$$

$$= 2^3 - \binom{3}{1}2^1 + \binom{3}{2}\cdot 1 - \binom{3}{3}\cdot 1$$

$$= 8 - 6 + 3 - 1 = 4$$

$N(c_1c_2c_3)$

$$S_2 = N(c_1c_2) + N(c_1c_3) + N(c_2c_3)$$



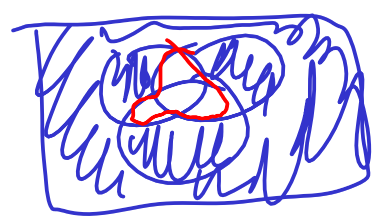
Ord. I.E

Exactly

At least

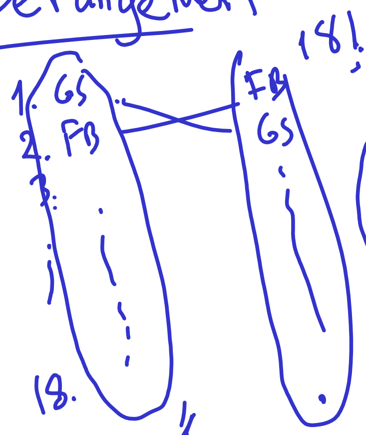
At most $m = S_0 - L_{m+1}$

M_m



at most 1

Derangement.



C_i : pos i turns out to be wrong.

$\text{round}\left(\frac{18!}{e}\right)$

$\bar{N}: S_0 - S_1 + S_2 - S_3 \cdots + S_{18}$

$\frac{\quad}{18!} = \frac{1}{e}$

$\frac{18!}{e}$

$= 18! - \binom{18}{1} \cdot 17! + \binom{18}{2} 16! - \binom{18}{3} 15! \cdots$

$\frac{1}{2.718}$

$\frac{18 \cdot 17}{2}$

$\binom{18}{18} 0!$

$= \frac{18!}{0!} - \frac{18!}{1!} + \frac{18!}{2!} - \frac{18!}{3!} + \frac{18}{4!} \cdots \frac{18!}{18!}$

$= \frac{18!}{e}$

$= 18! \left(\frac{1}{0!} - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} \cdots \right)$

e^{-1}

$\frac{1}{18!}$

$e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \frac{x^4}{4!} \cdots$

$\frac{d}{dx} e^x = 0 + 1 + x + \frac{x^2}{2} + \frac{x^3}{3!} \cdots = e^x$

$e^{-1} = 1 - 1 + \frac{1}{2!} - \frac{1}{3!} \cdots$

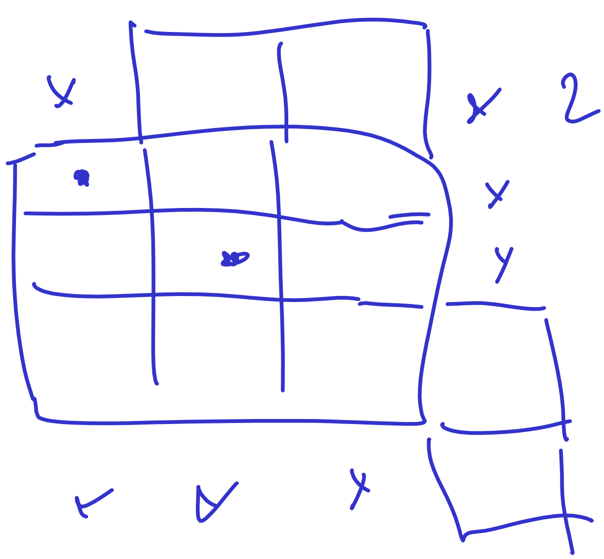
$\frac{4!}{e}$

$4! \left(1 - 1 + \frac{1}{2} - \frac{1}{6} + \frac{1}{24} \right)$

$\cancel{24 - 24} + 12 - 4 + 1 = 9$

$\lim_{n \to \infty} \left(1 - \frac{1}{n} \right)^n = \frac{1}{e}$

$\left(\frac{3M - 1050}{3000} \right)^{3000}$



2 rook

Gen.