Titolo nota 25/01/2007

$A = \{ \ldots \} \quad S_1, S_2 \ldots$

$S_i \subset \{1, \ldots, n\}$

$S_i \not\subset S_j$

$|A| \leq \binom{n}{\lfloor n/2 \rfloor}$

$$\sum_{i=0}^{n} \frac{s_i}{\binom{n}{\lfloor n/2 \rfloor}} \leq \sum_{i=0}^{n} \frac{s_i}{\binom{n}{i}}$$

s_i = NUMERO DI INSIEMI IN A CON i ELEMENTI

$$\binom{n}{\lfloor n/2 \rfloor} \geq \binom{n}{i}$$

$$\sum s_i \cdot i!(n-i)! \leq n!$$

$n!$ PERMUTAZIONI $\{1, \ldots, n\}$

$S \in A \qquad |S| = i$

$$(\sigma(1), \sigma(2), \ldots, \sigma(n))$$

$$(\sigma(1), \ldots, \sigma(i)) = S_i \qquad i < j$$

$$(\sigma(1), \ldots, \sigma(i), \ldots, \sigma(j)) = S_j$$

$S_i \subset S_j$ ASSURDO

$$\sum s_i \cdot i!\,(n-i)! \leq n!$$

$$\sum \frac{s_i}{\binom{n}{i}} \leq 1$$

$$\sum \frac{s_i}{\binom{n}{\lfloor \frac{n}{2} \rfloor}} \leq \sum \frac{s_i}{\binom{n}{i}} \leq 1$$

$$\sum s_i \leq \binom{n}{\lfloor n/2 \rfloor}$$

in un insieme parzialmente ordinato la cardinalità dell'anticatena più lunga è uguale al minor numero di ~~anti~~catene disgiunte in cui posso partizionare l'insieme

r) $a \, P \, a$

t) $a P b \wedge b P c \Rightarrow a P c$

a) $a P b \wedge b P a \rightarrow a = b$

i

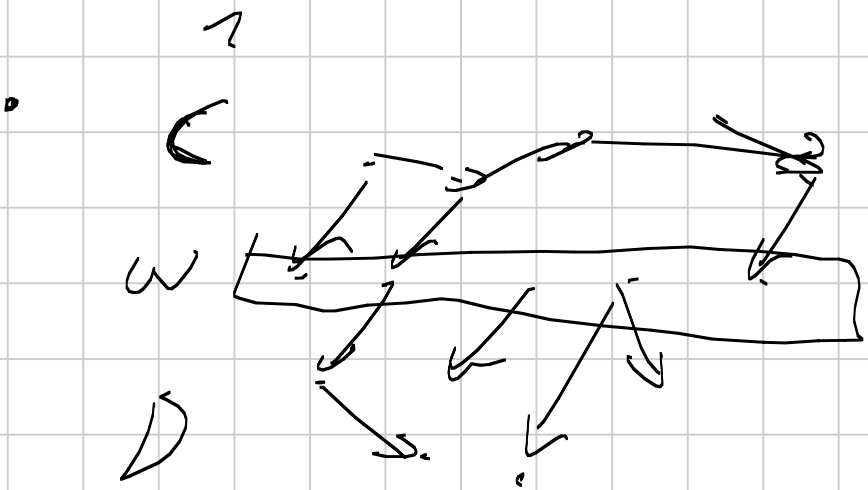
$a_1 \, P \, a_2 \, P \ldots P \, a_i$

i

$b, c \in K \quad b \neq c$

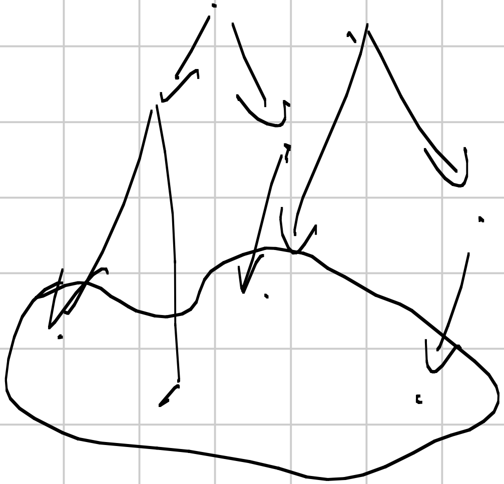
$|w|$

$Q \geq |w|$



$D \vee C = \emptyset$

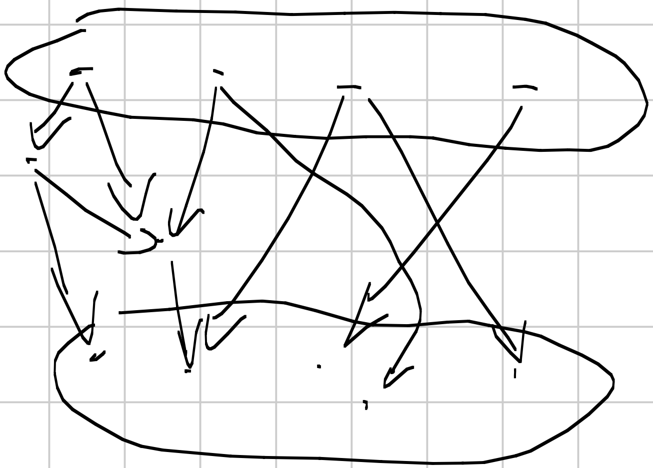
$w \cup C \vee w \cup D$



$|W|$

$|W| - 1$

$|W|$ catene



ω_2

ω_1

$|\omega_1| = |\omega_2|$

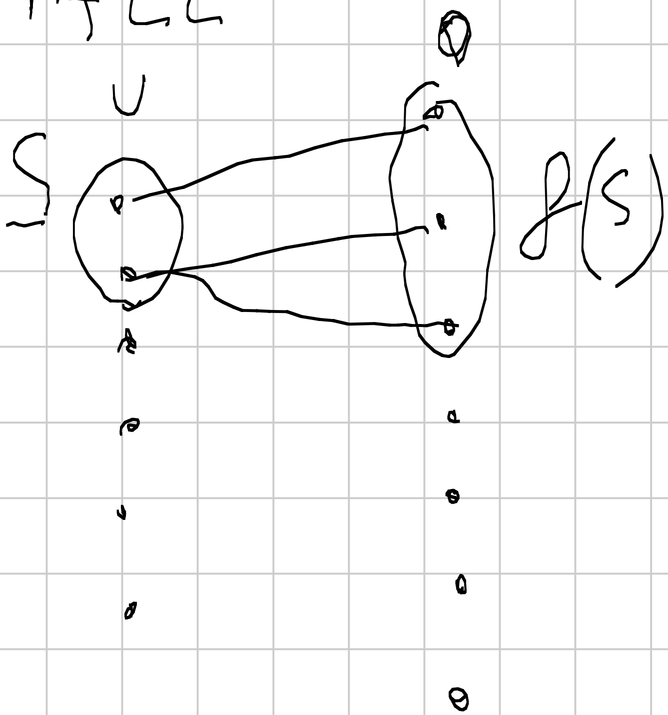
$a \in \omega_2$

$b \in \omega_1$

tale che $a P b$

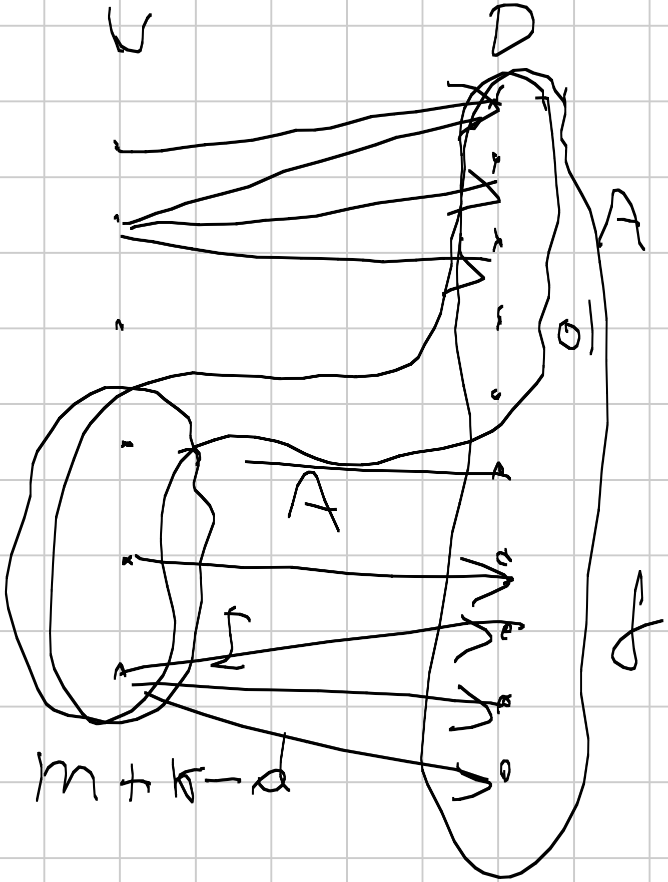
$\underbrace{(|W_1| - 1)}_{\text{catene}}$ elementi

HALL



$$|f(S)| \geq |S| \quad \forall S$$

Th CIASCUN U È FELICEMENTE SPOSATO.



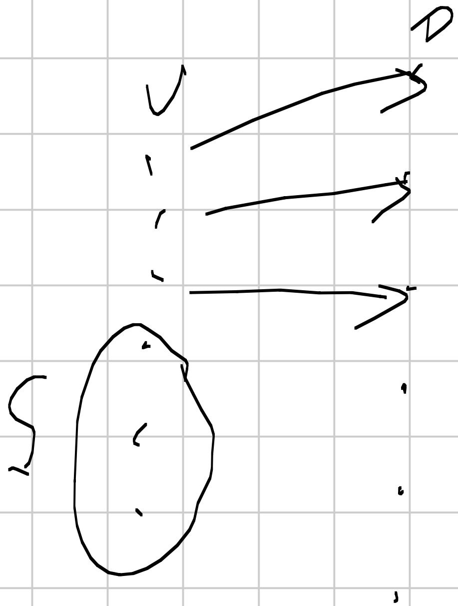
$m = |O|$

$|A| = m + k$

$f(I) \geq I$

$f(I) \cap A = \emptyset$

$m = |O| \geq |f(I)| + d \geq m + k \cancel{- d + d}$

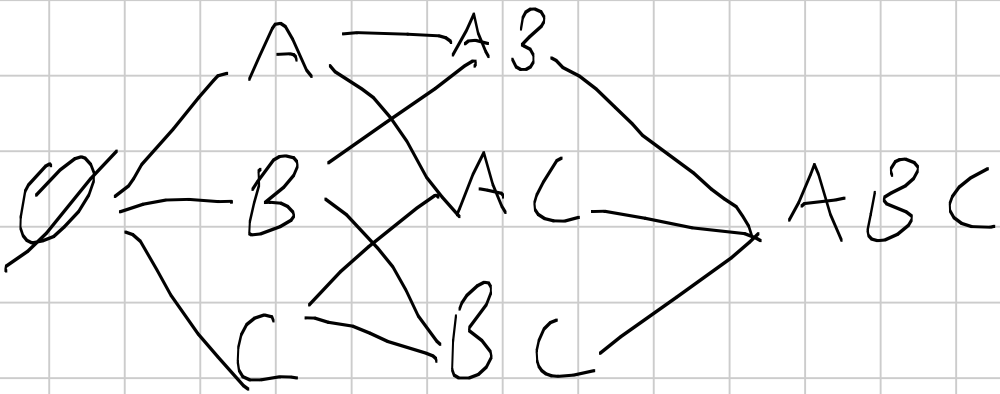


$$\cancel{|M|} \geq |S| + \cancel{|M|}$$

$$|S| = 0.$$

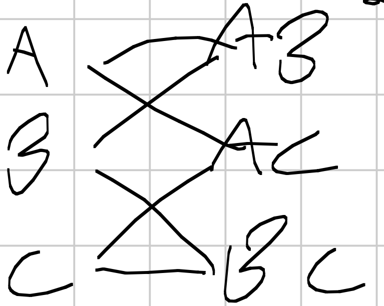
Sperner con HALL;

Tn: $\binom{n}{\lfloor \frac{n}{2} \rfloor}$



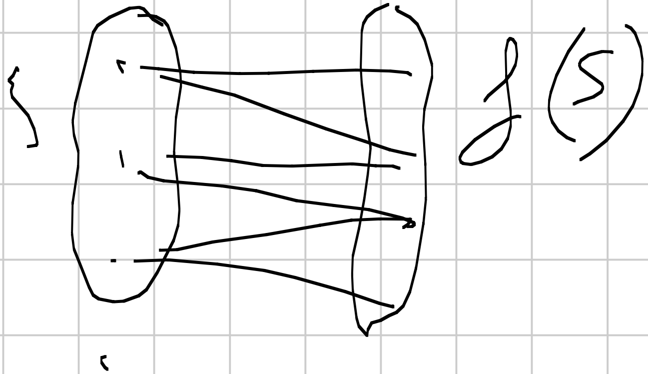
$i < \frac{n}{2}$

$i \qquad i+1$



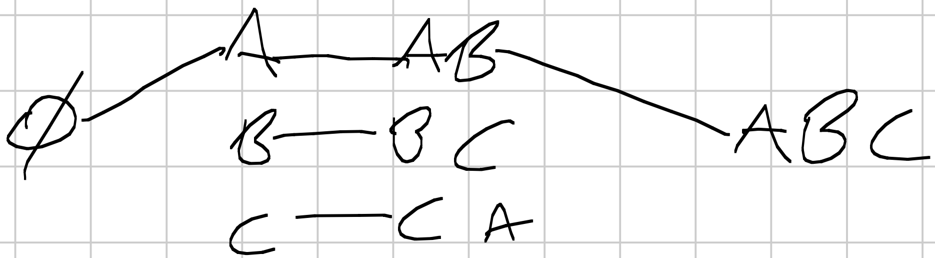
gli elementi del primo insieme hanno grado $n-i$

$i+1$



$$(n-1)|S| \leq (l+1)|f(S)|$$

$$|S| \leq \frac{(l+1)}{n-1}|f(S)| \leq |f(S)|$$



$$\binom{n}{\lfloor \frac{n}{2} \rfloor}$$

$\boxed{\text{PROIETTIVO !!!!}}$

$A_1, \dots, A_n \qquad |A_i| = 7 \qquad |A_i \cap A_j| \leq 3$

ogni terzetto sta in almeno un A_i.

$$\underbrace{\binom{7}{3} \cdot n}_{\text{Tutti i terzetti che compaiono}} \geq \binom{15}{3} \qquad \frac{\cancel{7} \cdot \cancel{6} \cdot \cancel{5}}{\cancel{6}} \cdot n \geq \frac{\cancel{15} \cdot \cancel{14} \cdot 13}{\cancel{6}}$$

$$n \geq 13$$

15 servono. Supponiamo $n \leq 14$. Claim: c'è un elemento che compare al max 6 volte.

14 insiemi di 7 elementi $\rightsquigarrow$ $14 \cdot 7$ elementi che compaiono in tutto

Un el. compare in media $\frac{14 \cdot 7}{15} < 7$ volte

wlog 1 compare ≤ 6 volte.

Ogni volta che compare accontenta $\binom{6}{2}^{=15}$ terzetti che lo contengono

Quanti sono i terzetti che contengono 1? $\binom{14}{2} = \frac{\cancel{14}^{7} \cdot 13}{\cancel{2}} = 91$

$90 = 15 \cdot 6 < 91.$

15 bastano

$15 = 2^4 - 1$ p.ti dello spazio proiettivo su $\mathbb{Z}_2$

(x, y, z, w) $x, y, z, w \in \mathbb{Z}_2$

tutte le quaterne meno quella nulla

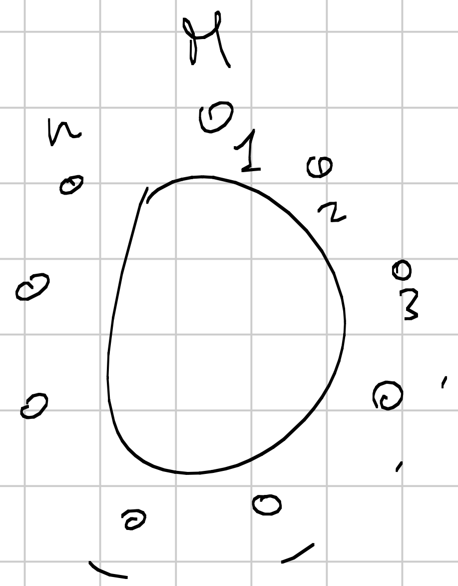
$ax + by + cz + dw \equiv 0 \; (2)$ $a, b, c, d \in \mathbb{Z}_2$ non tutti nulli

Perchè un piano ha 7 elementi

Facciamo finta che $a \neq 0$, quindi $a = 1$

$x = -(by + cz + dw)$ Comunque io scelga y, z, w trovo sempre un x

escluso $(0,0,0)$ sono 7



$1 \cdot n = n \equiv 0 \ (n)$

$g(i)$

$\sum_{i=1}^{n} i \, g(i)$

(n)

alle vele fune

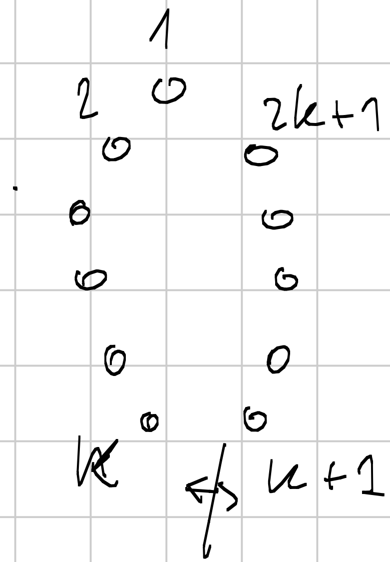
$$\begin{array}{ccc} & & g(m)-2 \\ & & \uparrow \\ 0 & 1 & g(m) & 1 \\ & \circ & \circ & \circ \\ & m-1 & m & m+1 \end{array}$$

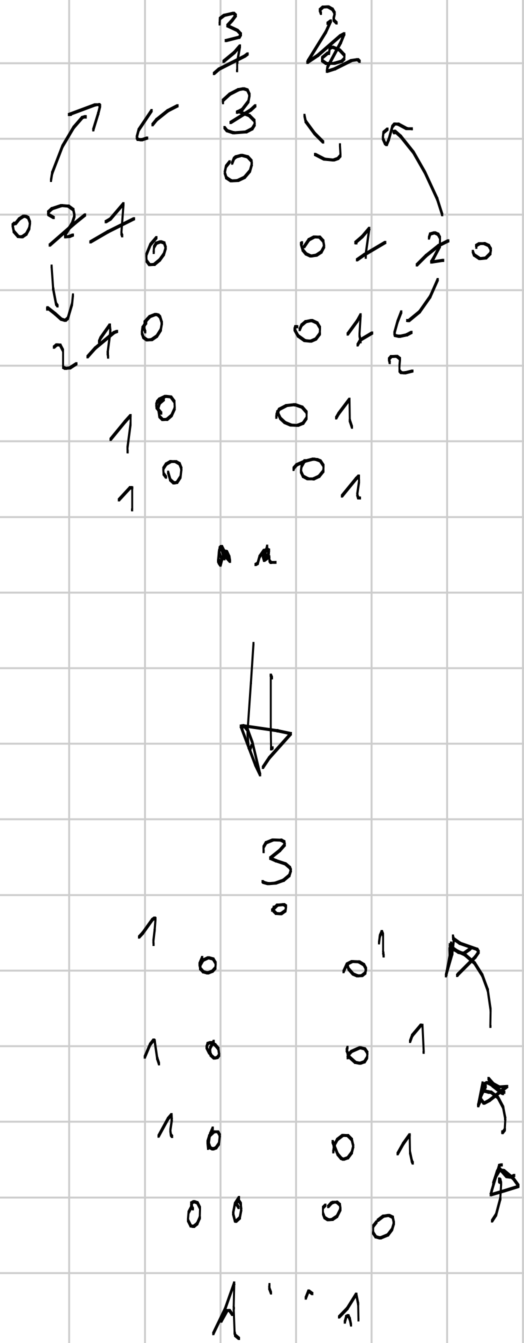
$m(g(m)-2) + 1 \cdot (m+1) + 1 \cdot (m-1) =$

$= m \cdot g(m)$

$1 + 2 + \dots + n = \frac{n(n+1)}{2} \equiv 0 \ (n)$

$\sum i \, g(i) = \sum$ posizione delle medaglie


1
2
2k+1
k
k+1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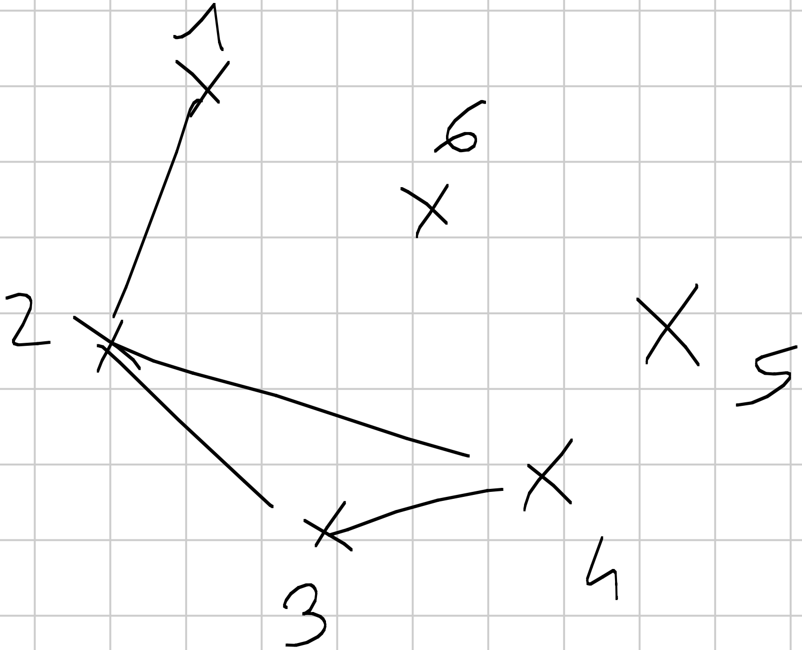
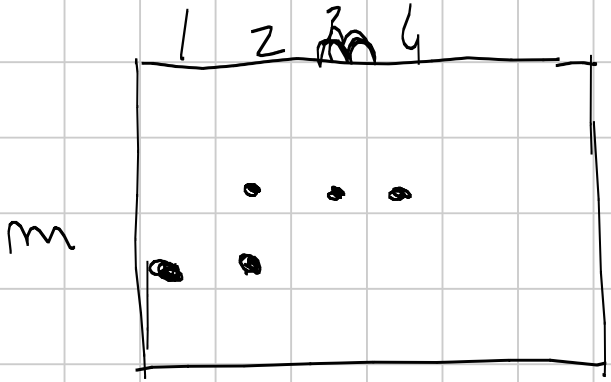
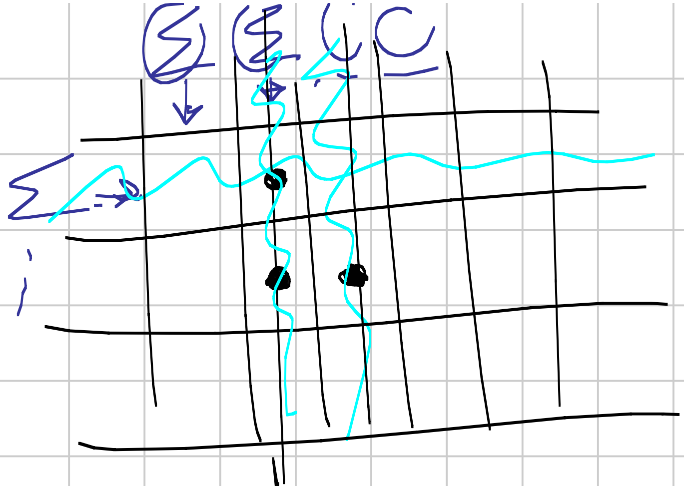




1 grafo connesso

2 " non "

1. $n\cancel{\Sigma} = m\cancel{\Sigma} \Rightarrow n = m$



2.