COMBINATORIA – MATTINO

Titolo nota 27/05/2009

① n $\quad 2(n-1)$ $\quad 2\binom{n}{2}\cdot 1 = n(n-1)$ $\qquad 1 \quad \frac{1}{2} \quad 0$

ogni giocatore ha $\boxed{n-1}$ punti su $2(n-1)$ partite

(a) numero pari di pareggi $\underbrace{0, 2, 4, \dots, 2(n-1)}_{n \text{ valori}}$

R.P.A. ci sarebbe un giocatore con 0 pareggi, uno con 2, ... uno con $2(n-1)$ assurdo

(b) R.P.A. tutti numeri di vittorie (col bianco) distinti

$\underbrace{0, 1, 2, \dots, n-1}_{n \text{ valori}}$ $\to$ ci sarebbe un giocatore con 0 v.b. uno con 1 v.b. ... uno con $n-1$ v.b.

$n-1$ v.b. $\to$ 0 p.b., 0 s.b., 0 v.n., 0 p.n., $n-1$ s.n.

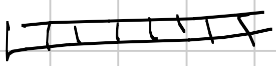
assurdo.

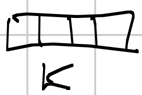
2) determinare (m,n) in modo che

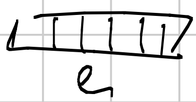
somma dei numeri in $\boxed{+}$ neg

somma dei numeri in $\boxed{\#}$ pos.

COSE INTERESSANTI IN 1D







MAX $k+\ell-2$

CONTROES. CON $k+\ell-2$ SI FA CON

2 VALORI a E b

1) 4x4 NON SI FA (*) DIM

2) 3 x n SI FA (**) ESEMPIO

a	b	b	b	a
b	b	a	b	b
a	b	b	b	a

a	a	a	a	a	a	a	a	a	a	
b	b	b	b	b	b	b	b	b	b	b
a	a	a	a	a	a	a	a	a		

$2(a+b)<0$

$3b+6a>0$

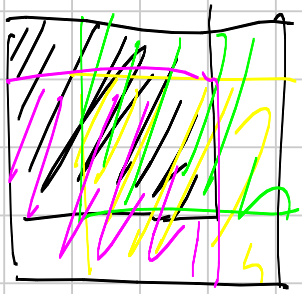
$-1{,}001 \quad +1$

$\{a_i\}$ 5 consecutivi <0 $\quad 7>0$

$$
\left.\begin{aligned}
&a_1+a_2+a_3+a_4+a_5 \leq 0\\
&a_2+a_3+a_4+a_5+a_6 \leq 0\\
&\vdots \qquad\qquad\qquad\qquad\quad <0\\
&a_7+a_8+a_9+a_{10}+a_{11} < 0
\end{aligned}\right\}
$$

somme lungo le righe negative

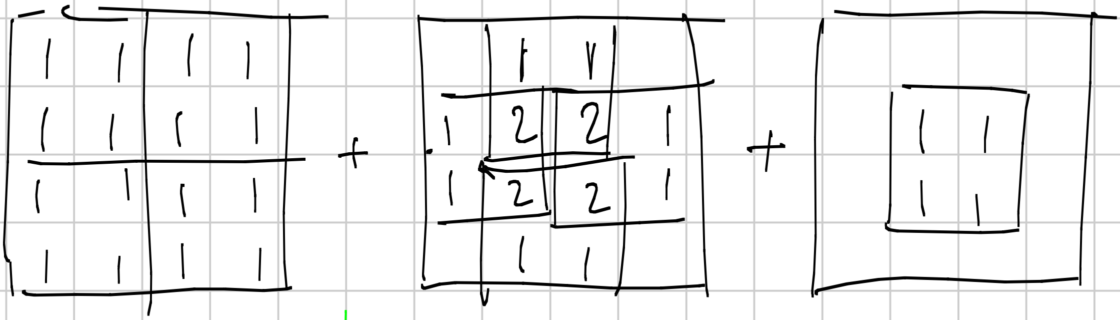
$$\underbrace{\vee 0 \quad \vee 0 \quad \vee 0 \quad \vee 0 \quad \vee 0}_{\text{SOMME LUNGO COLONNE POSITIVE}}$$



1	2	2	1
2	4	4	2
2	4	4	2
1	2	2	1

>0

somme dei numeri in questi quadrati



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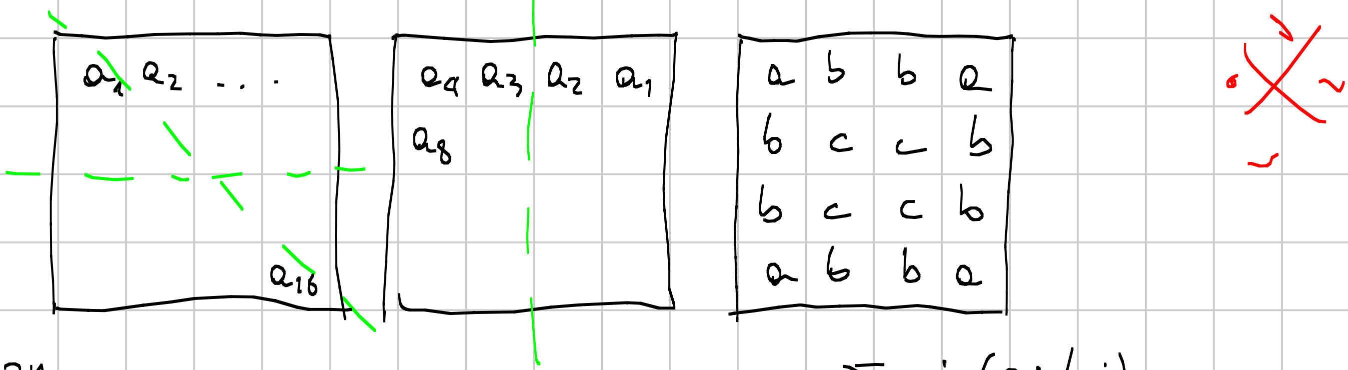
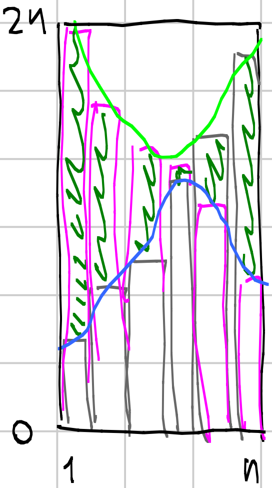


③



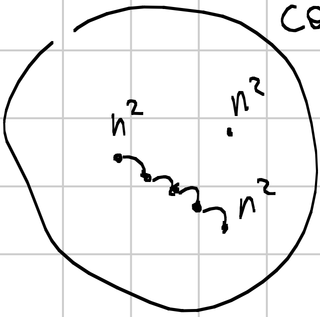
$$\sum_i \min(a_i, b_i)$$

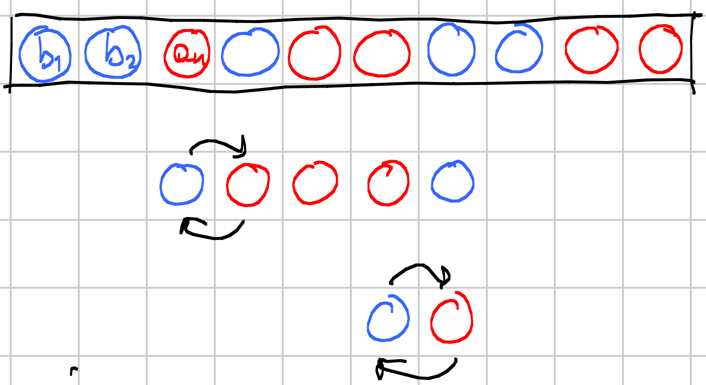
$$\sum_1^n a_i + \sum_1^n b_i - 2 \text{ intersezione} = n^2$$

$$\sum_1^{n''} i$$

$$\sum_1^{2n} i - 2\sum_1^n i = \frac{2n(2n+1)}{2} - n(n+1) = n^2$$

conf





distinguo un po' di casi

$$a_j + 1 = b_k \rightleftarrows b_k + 1 = a_j$$

$j < k$ ✓

$j = k$ gratis

$j > k$ ✓

... e contiamo una configurazione facile

④ • n vertici

e archi connessi $\qquad \binom{n}{2} = e + v$

v archi non connessi

t

c

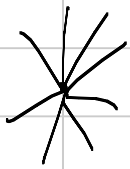
d

h

$$\left\{ (n-2)e = 3t + 2c + d \right\} \text{ per } d$$

$$\left\{ (n-2)v = 3h + 2d + c \right\} \text{ per } h$$

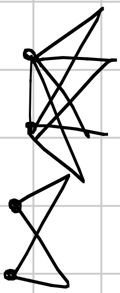
$$\left\{ \binom{n}{3} = t + c + d + h \right\} \text{ comb. lineare}$$



$$8n = 2e$$

$$\binom{8}{2} n = 3t + c$$

$$\begin{cases} e = 4n \\ 28n = 4e + 2v \\ n(n-1) = 2e + 2v \end{cases}$$



$$4e = 3t$$

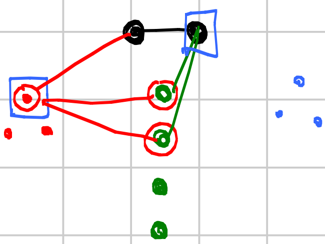
$$2v = c$$

$$28n = n^2 - n + 8n$$

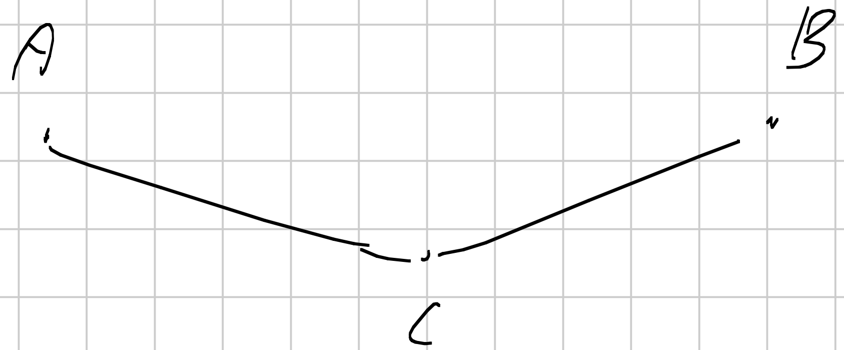
$$n^2 - 21n = 0$$

$$n \neq 0$$

$$\boxed{n = 21}$$



assurdo



$X = \{$ D conoscono A e C $\}$

$Y = \{$ D conoscono B e C $\}$

$$Z = \underset{\underline{1}}{\{A\}} \cup \underset{\underline{1}}{\{B\}} \cup \underbrace{X \cup Y}_{2} \cup \dots$$