PROVE RIPETUTE basate su exp. a due esiti

n prove

K successi — p prob. successo

$n-K$ insuccessi — $q=1-p$ prob. insuccesso

$$P_n(k) = ?$$

esempio

N palline — N_B bianche — $N-N_B$ nere

n num. prove

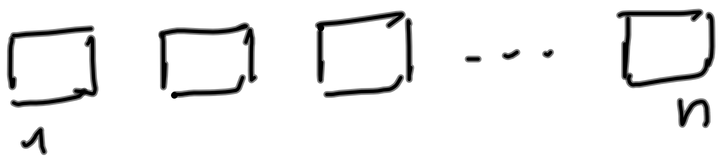
K successi

$$P_n(k) = \frac{n \text{ favorevoli}}{n \text{ casi totali}}$$

casi totali

$$N \cdot N \cdots N = N^n$$

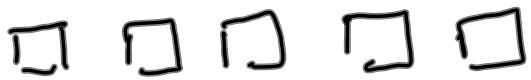
casi favorevoli



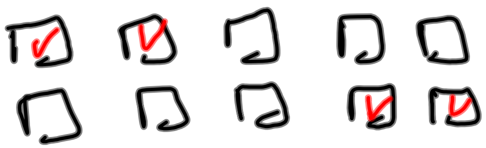
1) 1, 2, 3, ..., k

2) 1, 3, ..., k+1

3) 3, 6, 8, 10, ...



$n = 5$
$k = 2$



$C_{5,2}$

$C_{n,k}$

$\boxed{\checkmark}\ \boxed{\checkmark}\ \boxed{\ }\ \boxed{\ }\ \boxed{\ }$

1 1

1 2

2 1

2 2

N_B^K

1 1 ... 7 9 10

6 8 9 $\quad N_B^K (N-N_B)^{n-k}$

$$C_{n,k}\, N_B^K (N-N_B)^{n-k}$$

$$P_r(k) = \frac{fav}{TOT} = \binom{n}{k} \frac{N_B^K (N-N_B)^{n-k}}{N^n} =$$

$$= \binom{n}{k} \frac{N_B^K}{N^K} \frac{(N-N_B)^{n-k}}{N^{n-k}} = \binom{n}{k} \left(\frac{N_B}{N}\right)^K \left(\frac{N-N_B}{N}\right)^{n-k}$$

$$= \binom{n}{k} p^K (1-p)^{n-k} = \binom{n}{k} p^k q^{n-K}$$

es

lancio dado

successo $\quad$ res < 3

$n = 10$

COEFF BINOMIALE $\binom{n}{k}$

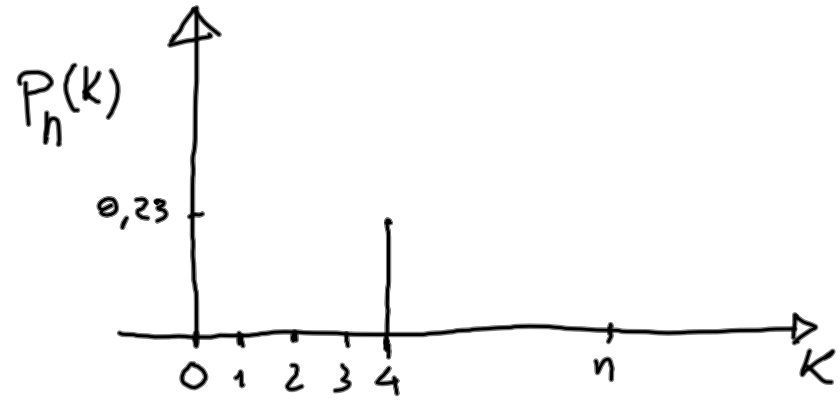
$$\binom{n}{k} = \frac{n!}{(n-k)!\,k!}$$

$$P_n(k) = \binom{n}{k} p^k q^{n-k}$$

$p = \frac{2}{6} = \frac{1}{3} \qquad q = \frac{2}{3} \qquad K = 4 \quad n = 10$

$$P_{10}(4) = \binom{10}{4} \frac{1}{3}^4 \frac{2}{3}^6 = \frac{10!}{6!\,4!} \frac{1}{3}^4 \frac{2}{3}^6 =$$

$$= 210 \cdot 0{,}0011 \cong 0{,}23$$



$\boxed{es}$

106 maschi ogni 100 femmine

nasca femmina $\equiv$ successo

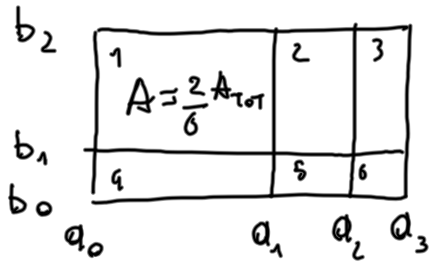
$n = 4$

$K = 3$

$p = \frac{100}{206} \qquad q = \frac{106}{206}$

$$P_4(3) = \binom{4}{3} \left(\frac{100}{206}\right)^3 \frac{106}{206} = 0{,}28$$

<u>esame 16/07/07</u>



- num. rett.?
- $n = 10$ successi A_1 $P_n(4)$

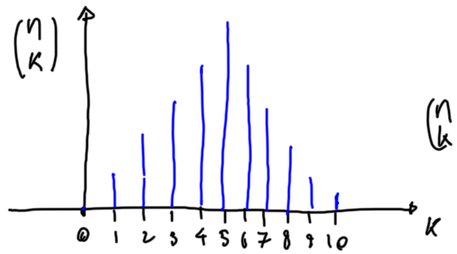
- $a_i\, a_j\, b_k\, b_h \Rightarrow$ num. rett. $C_{4,2} \cdot C_{3,2} = \frac{4!}{2!\,2!} \frac{3!}{2!\,1!}$

- $P_{10}(4) = \binom{10}{4} p^4 q^6 \qquad P_{10}(4) = \frac{10!}{6!\,4!} \left(\frac{2}{6}\right)^4 \left(\frac{4}{6}\right)^6$

$P(A_1) = p = \frac{\frac{2}{6} A_{TOT}}{A_{TOT}} = \frac{2}{6}$

Rifare grafico coeff. binomiale

pag. 129 $\quad n = 10$



$$\binom{n}{k} = \frac{n!}{k!\,(n-k)!}$$

$a = n! \cdot [\underbrace{1 \; \cdots\cdots \; 1}_{\text{11 elementi}}]$

$b = [0! \;\; 1! \;\; 2! \; \cdots \; 10!]$ $\qquad$ res = a./(b.*c)

$c = [10! \;\; 9! \;\; 8! \; \cdots \; 0!]$

$\uparrow_{k=2} \qquad \dfrac{10!}{1!\;9!}$

es_2

$P_n(k) \qquad k = 0, 1, \dots 10$

succ $\quad$ res < 3

$n = 10$

$p = \frac{1}{3} \quad q = \frac{2}{3}$

$$P_n(k) = \binom{n}{k} p^k q^{n-k}$$

- successo $\quad$ res = 1
- successo $\quad$ res ≤ 5 $\longrightarrow$ $p = \frac{5}{6} \quad q = \frac{1}{6}$