

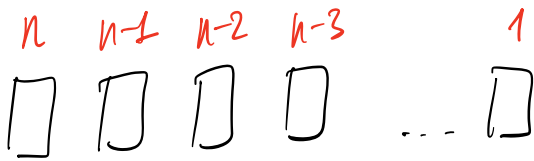
Choisir k parmi n

n, k entiers

ordre?

répétitions?

$n!$ Choisir n parmi n en tenant compte de l'ordre.



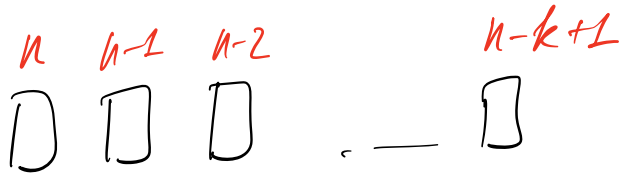
n cases

Permutations

A_k^n

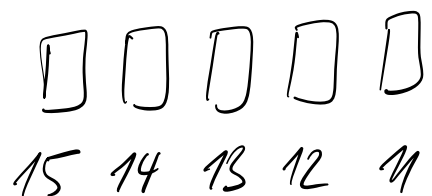
Choisir k parmi n , avec ordre

sans répétitions

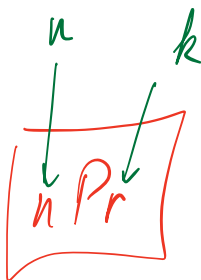


k

A_5^{15}

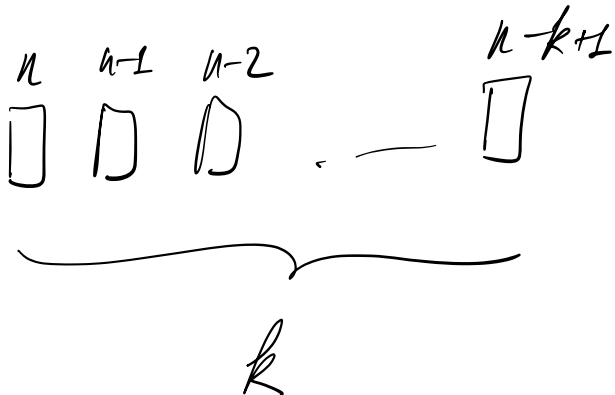


$$A_k^n = \frac{n!}{(n-k)!}$$



Combinerisms

$$C_k^n = \binom{n}{k}$$



$$\frac{n!}{(n-k)! k!} = C_k^n$$

15 personnes

choisir un groupe
de 5 pers.

Diagram illustrating the calculation of combinations for 15 people choosing a group of 5. It shows five boxes representing the 5 people, followed by the calculation $15 \cdot 14 \cdot 13 \cdot 12 \cdot 11$, and then a horizontal line with $5!$ below it.

Diagram illustrating the formula nCr in a red box, with green arrows pointing to n and r from the labels n and k above.

$$C_3^{15} = \frac{15!}{12! 3!} = \frac{15 \cdot 14 \cdot 13}{6}$$

Arrangement avec répétition

avec ordre

$$\overline{A}_3^5 = 5^3$$

$$\overline{A}_k^n = n^k$$

ABCDE

□ □ □
5 · 5 · 5

Choisir k parmi n

$$0! = 1$$

	ordre	ordre
repetitions	$A_k^n = n^k$	$C_k^n = C_k^{n+k-1}$
repetitions	$A_k^n = \frac{n!}{(n-k)!}$	$C_k^n = \frac{n!}{(n-k)! k!}$

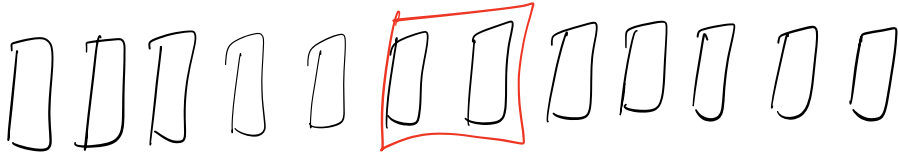
$A_n^n = n!$

$$\frac{n!}{(n-2)!} = \frac{n \cdot (n-1) \cdot \cancel{(n-2)!}}{\cancel{(n-2)!}} = n(n-1) = n^2 - n$$

$$n! = n \cdot (n-1) \cdot \boxed{(n-2) \cdot (n-3) \cdot \dots \cdot 2 \cdot 1}$$

$(n-2)!$

$$\frac{15!}{13!} = 15 \cdot 14$$



$12 \cdot 11 \cdot 10 \cdot$

$\cdot 2 \cdot 1$

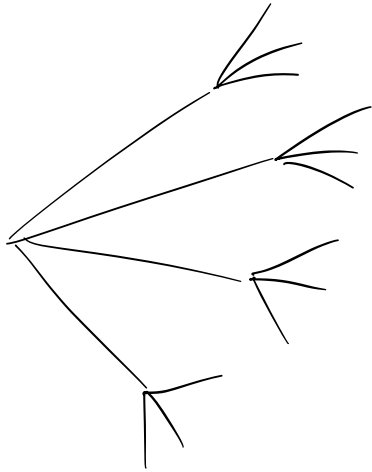
12 objets dans 12 cases ✓ $12!$

$\overline{1} \overline{2}$

$11! \cdot 2!$

$\overline{2} \overline{1}$

4 - 3 - 50



	G	R
	4	3
	3	4
	2	5
	1	6
	0	7

$C_7^8 - 8$ donne la réponse

$$C_4^4 \cdot C_3^8 =$$

$$C_3^4 \cdot C_4^8 =$$

$$C_2^4 \cdot C_5^8 = \frac{4 \cdot 3}{2} \cdot \frac{8 \cdot 7 \cdot 6}{3!}$$

$$C_1^4 \cdot C_6^8 = 4 \cdot \frac{8 \cdot 7}{2}$$

$$C_0^4 \cdot C_7^8 = 8$$

5D 10U

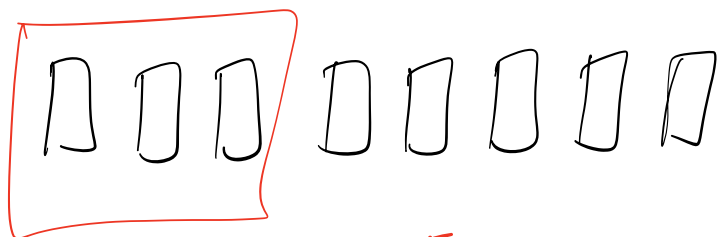
$$C_5^{15} = C_{10}^{15}$$

5(+) 10(1)

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 = 10$$

$$\overline{C}_{10}^6 = \binom{10+6-1}{10}$$

5 horses 8 places



$$\underbrace{3 \cdot 2 \cdot 1}_{3!} \cdot C_2^5$$