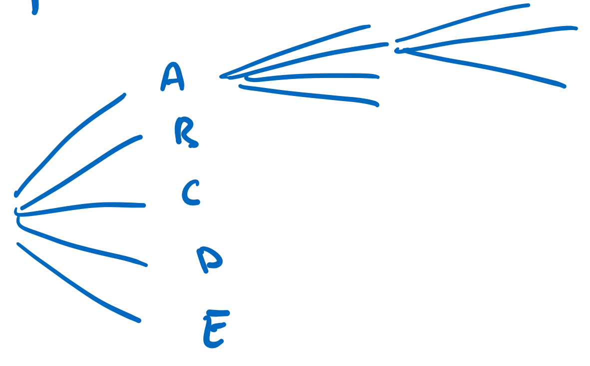
$$C_n^i = \frac{n!}{(n-i)!\,i!} = \frac{A_n^i}{i!}$$

$$A_n^i = \frac{n!}{(n-i)!} = \frac{n(n-1)(n-2)\cdots(n-i+1)\cancel{(n-i)!}}{\cancel{(n-i)!}}$$

↳ nombre de façons de choisir i éléments parmi n, ordonnés, mais sans répétitions



ABC
ACB
BAC
BCA
CAB
CBA

$\rightarrow 6 = 3!$

$$5 \times 4 \times 3 = A_5^3 = \frac{5!}{(5-3)!} = 5 \times 4 \times 3.$$

$$C_5^3 = \frac{A_5^3}{3!} = \frac{5 \times 4 \times 3}{6} = 10.$$

↳ nombre de permutations des 3 éléments.

$$C_n^i = C_{n-1}^i + C_{n-1}^{i-1}$$

$$B_i^n(t) = C_n^i\, t^i (1-t)^{n-i}$$

$$= \left(C_{n-1}^i + C_{n-1}^{i-1}\right) t^i (1-t)^{n-i}$$

$$= C_{n-1}^i\, t^i (1-t)^{n-i} + C_{n-1}^{i-1}\, t^i (1-t)^{n-i}$$

$$= (1-t)\underbrace{C_{n-1}^{i}\, t^{i} (1-t)^{n-1-i}}_{B_i^{n-1}(t)} + t\,\underbrace{C_{n-1}^{i-1}\, t^{i-1} (1-t)^{n-1-(i-1)}}_{B_{i-1}^{n-1}(t)}$$