

$$(a+b)^4 = (a+b) \cdot (a+b) \cdot (a+b) \cdot (a+b)$$

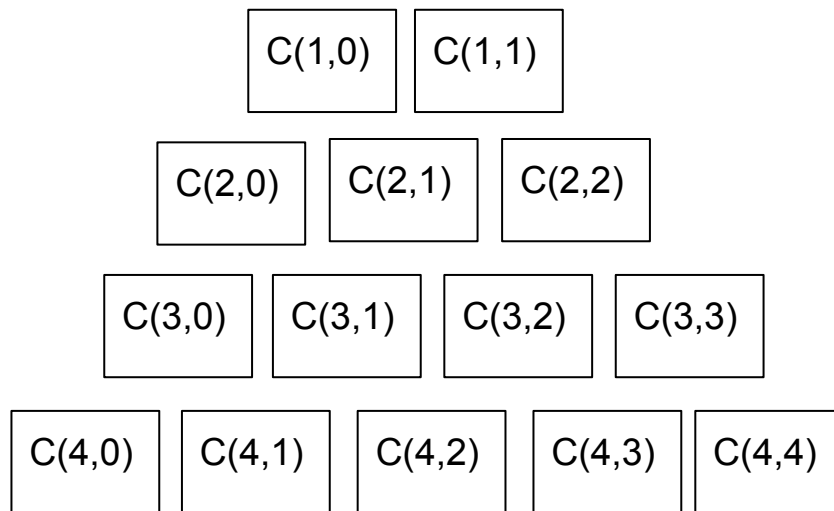
$$a a a b = a^3 b$$

$$a b a a = a^3 b \quad C(4,3) = \frac{4 \cdot 3 \cdot 2}{3!} = C(4,1)$$

$$C(4,0) = \frac{4!}{4! \cdot 0!} = 1$$

$$(a+b)^{107} = C(107,4) a^{103} b^4$$

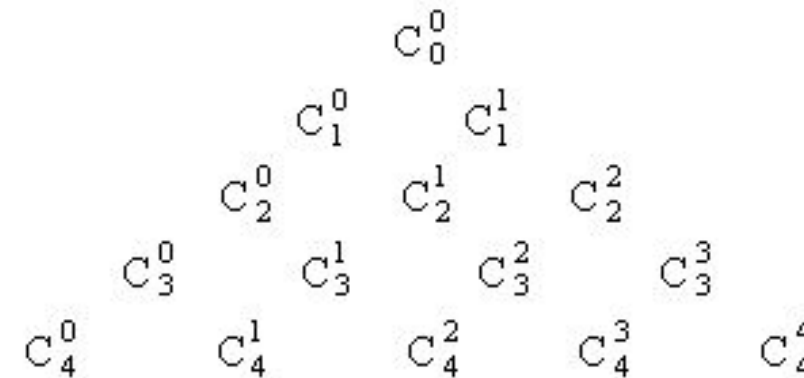
$$C(n,k) = C(n,n-k)$$



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

$$C(4,2) = \frac{4!}{2! \cdot (4-2)!} = 6$$

$$(a+b)^{117} = a^{117} + 117 a^{116} b + C(117,2) a^{115} b^2 + \dots$$



$$(a+b+c+\dots+d)^k = P(k_1, k_2, \dots, k_t)^*$$

$$(a+b+c)^5 = P(2,2,1) a^2 b^2 c + P(3,1,1) a^3 b c + P(2,3,0) a^2 b^3 + \dots$$

$$P(k_1, k_2, \dots, k_t) = \frac{(k_1 + k_2 + \dots + k_t)!}{(k_1! \cdot k_2! \cdot \dots \cdot k_t!)}$$