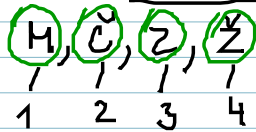
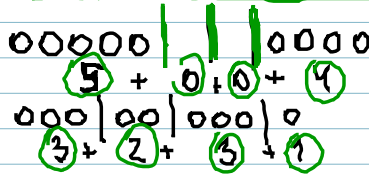


MAJEME 9 STEJNÝCH FIGUREK A 4 RŮZNÉ BARVY. KOLIKA RŮZNÝMI ZPŮSOBY JF MOŽNĚ VŠECHNY FIGURKY OBARVIT?



x_i - počet figurek obarvených barvou i
 $i \in \{1, 2, 3, 4\}$

$$x_1 + x_2 + x_3 + x_4 = 9 \quad x_i \in \mathbb{N}_0$$



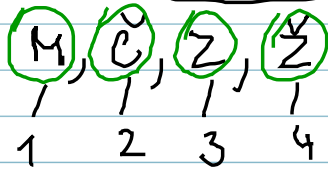
$$\begin{array}{ccccccc} 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 \end{array}$$

$$X = \binom{12}{3} = \binom{12}{9} = \frac{12!}{3! 9!} = \frac{2 \cdot 12 \cdot 11 \cdot 10}{6} = 22 \cdot 10 = 220$$

$$C^*(n, k) = \binom{n+k-1}{k} = \binom{n+k-1}{n-1}$$

$$C^*(4, 9) = \binom{12}{9} = \binom{12}{3}$$

MÁME 9 STEJNÝCH FIGUREK A 4 RŮZNÉ BARVY. KOLIKA RŮZNÝMI ZPŮSOBY JE MOŽNÉ VŠECHNY FIGURKY OBARVIT?



X_i - počet figurek obarvených barvou i
 $i \in \{1, 2, 3, 4\}$

$$\underline{X_1 + X_2 + X_3 + X_4 = 9} \quad X_i \in \mathbb{N}_0$$

$$\begin{array}{cccc|cccc} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \textcircled{5} & + & \textcircled{0} & + & \textcircled{0} & + & \textcircled{4} & \end{array}$$

$$\begin{array}{ccc|cc|ccc|c} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \textcircled{3} & + & \textcircled{2} & + & \textcircled{3} & + & \textcircled{1} & \end{array}$$

$$\begin{array}{cccccccc} 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 \end{array}$$

$$X = \binom{12}{3} = \binom{12}{9} = \frac{12!}{3! 9!} = \frac{2 \cdot 12 \cdot 11 \cdot 10}{6} = 22 \cdot 10 = 220$$

$$C^*(n, k) = \binom{n+k-1}{k} = \binom{n+k-1}{n-1}$$

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