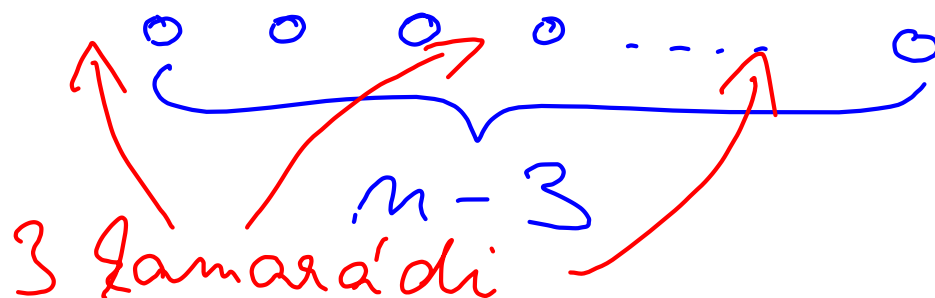


$$7! = 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 = 5040$$

$$\frac{7!}{7 \cdot 2} = \frac{6!}{2} = \frac{720}{2} = 360$$

$n!$

Trik: seřadíme nejprve  
"nekamárady":  $(n-3)!$

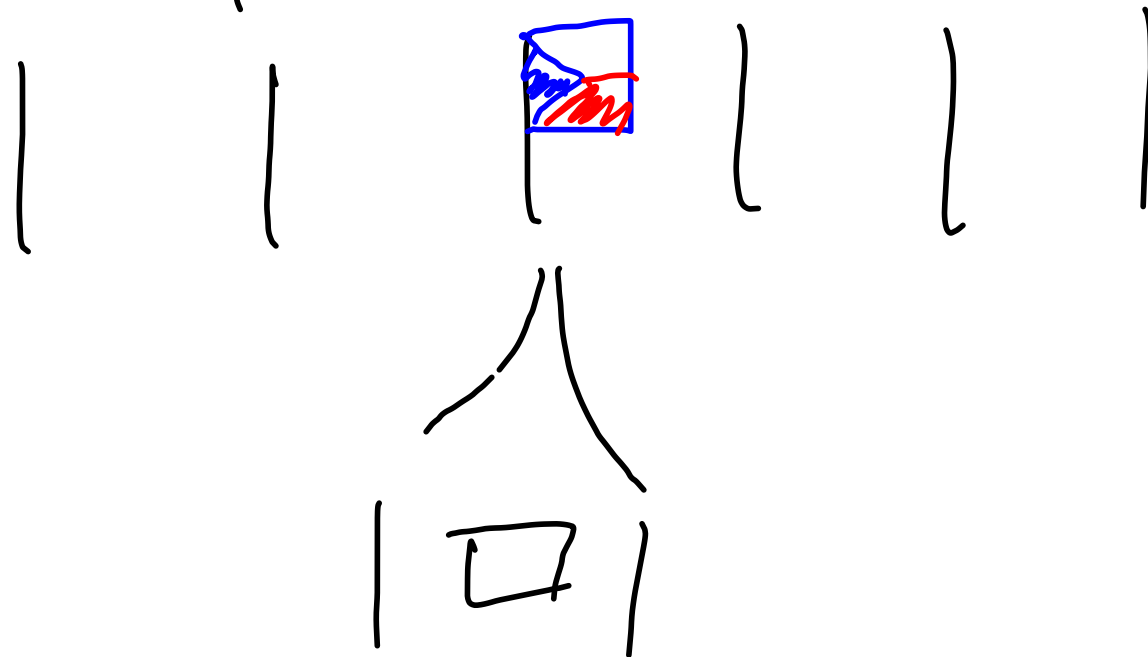


$$(n-2)(n-3)(n-4)$$

celkem:  $(n-3)!(n-2)(n-3)(n-4)$

$$(n-2)!(n-3)(n-4)$$

Postupně



celkem  $n \cdot (n+1)(n+2) \cdot \dots \cdot (n+k-1)$

jiny zp.

$(n+k-1)(n+k-2) \cdot \dots \cdot (n+k-k)$

celkem 36 možností!

houčat 7 ... 6 možností!

houčat 6 ... 5 možností!

$$P(7) = \frac{6}{36} = \frac{1}{6}$$

$$P(6) = \frac{5}{36}$$

$(1,1)$

$$\frac{6}{21} = \frac{2}{7}$$

$(1,2)$

$(2,2)$

$(1,3)$

$(2,3)$

$(3,3)$

$\vdots$

$\vdots$

$\vdots$

$(1,6)$

$(2,6)$

$\vdots$

$(6,6)$

celkem..  $n^n$   
správných...  $n!$   
PST ...  $\frac{n!}{n^n}$

celkem...  $365^k$

špatné možnosti...  $365 \cdot 364 \cdot \dots \cdot (366 - k)$

dobré =  $365^k - 365 \cdot \dots \cdot (366 - k)$

$$PST = \frac{365^k - 365 \cdot \dots \cdot (366 - k)}{365^k}$$

celkem...  $\binom{52}{5}$

dobře ... ,  $\frac{52 \cdot 48 \cdot 44 \cdot 40 \cdot 36}{5!}$

$$PST = \frac{\frac{52 \cdot 48 \cdot 44 \cdot 40 \cdot 36}{5!}}{\frac{52 \cdot 51 \cdot 50 \cdot 49 \cdot 48}{5!}} =$$

$$= \frac{\cancel{48} \cdot 44 \cdot 40 \cdot 36}{51 \cdot 50 \cdot 49 \cdot \cancel{48}} =$$



celkem ...  $n^k$   
dobrych ...  $\binom{k}{i} \cdot (n-1)^{k-i}$   
PST 
$$\frac{\binom{k}{i} (n-1)^{k-i}}{n^k}$$

DŮSLEDEK:

$$\sum_{i=0}^k \binom{k}{i} (n-1)^{k-i} = n^k$$

$$m = n-1$$

$$\sum_{i=0}^k \binom{k}{i} m^{k-i} = (m+1)^k$$

alem...  $6^{12}$

dobrych...  $\binom{12}{2} \cdot \binom{10}{2} \cdot \binom{8}{2} \cdot \binom{6}{2} \cdot \binom{4}{2}$

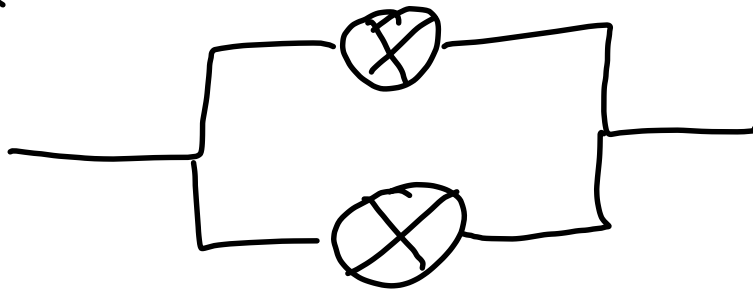
$$\begin{aligned} \text{PST} &= \frac{\binom{12}{2} \binom{10}{2} \binom{8}{2} \binom{6}{2} \binom{4}{2}}{6^{12}} \\ &= \frac{\frac{12 \cdot 11}{2} \cdot \frac{10 \cdot 9}{2} \cdot \frac{8 \cdot 7}{2} \cdot \frac{6 \cdot 5}{2} \cdot \frac{4 \cdot 3}{2} \cdot \frac{2 \cdot 1}{2}}{6^{12}} \\ &= \frac{12!}{2^6 \cdot 6^{12}} \end{aligned}$$

seriové



$$P_{ST} = (0,8)^2 = 0,64$$

paralelné



$$\begin{aligned} P_{ST} &= 1 - (1 - 0,8)^2 = \\ &= 1 - 0,04 = 0,96 \end{aligned}$$

$$\begin{array}{l}
 \text{1. hole} \quad \dots \quad \frac{1}{2} \\
 \text{3. hole} \quad \dots \quad \frac{1}{4} \cdot \frac{1}{2} \\
 \text{5. hole} \quad \dots \quad \frac{1}{16} \cdot \frac{1}{2} \\
 \vdots \\
 \text{(2n+1). hole} \quad \dots \quad \frac{1}{2^{2n}} \cdot \frac{1}{2}
 \end{array}$$

$$\text{celkem} \quad \sum_{m=0}^{\infty} \frac{1}{2} \cdot \frac{1}{2^{2m}} = \frac{1}{2} \cdot \frac{1}{1-\frac{1}{4}} =$$

$$= \frac{1}{2} \cdot \frac{4}{3} = \frac{2}{3}$$

$$P = \frac{1}{2} + \frac{1}{2}(1-P)$$

$$\frac{3}{2}P = 1 \Rightarrow P = \frac{2}{3}$$