12.4: $Y_i = \begin{cases} 1 & \dots i\text{-tý bažant přežije} \\ 0 & \dots \text{jinak} \end{cases}$

$X = \sum_{i=1}^{10} Y_i$ = počet přežívších bažantů

$\mathbb{E}X = \sum_{i=1}^{10} \mathbb{E}Y_i = \sum_{i=1}^{10} \left(1 \cdot \mathbb{P}(Y_i = 1) + 0 \cdot \mathbb{P}(Y_i = 0)\right) = 10 \cdot \mathbb{P}(Y_i = 1$

$(*) = \mathbb{P}(Y_i = 1) = \sum_{k=0}^{10} \mathbb{P}(Y_i = 1, \text{vybrán } k_x) = \sum_{k=0}^{10} (1-\lambda)^k \binom{10}{k} \left(\frac{1}{10}\right)^k \left(\frac{9}{10}\right)^{10}$

$k = 0, 1, \dots, 10$: $\mathbb{P}(Y_i = 1 \mid \text{vybrán } k_x) = (1-\lambda)^k = \mathbb{P}(Y_i = 1, \text{vybrán } k_x) / \mathbb{P}(\text{vyb}$

$\mathbb{P}(\text{vybrán } k_x) = \binom{10}{k} \left(\frac{1}{10}\right)^k \left(\frac{9}{10}\right)^{10-k}$

$(*) = \left((1-\lambda)\frac{1}{10} + \frac{9}{10}\right)^{10} = \left(1 - \frac{\lambda}{10}\right)^{10}$

$\frac{1}{10} \cdot \lambda = \frac{\lambda}{10} = \mathbb{P}(j\text{-tý lovec vybral } i\text{-tého bažanta, trefil}) = \frac{1}{\text{lov}}$

$1 - \frac{\lambda}{10} = \mathbb{P}(j\text{-tý lovec nezabil } i\text{-tého bažanta})$ i-

$\lambda = \frac{1}{2} \Rightarrow \mathbb{E}X \doteq 5{,}987$, $\lambda = 0 \Rightarrow \mathbb{E}X = 10$

$\lambda = 1 \Rightarrow \mathbb{E}X \doteq 3{,}487$