

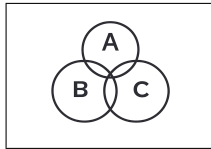
M

Hyper-geometric Random Variable

M



$$\begin{aligned}N &= 5 \\K &= 2 \\n &= 2 \\k &= 1\end{aligned}$$

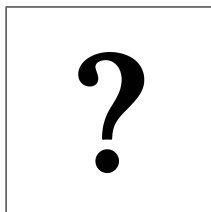


$$P(X = k) = \frac{\binom{K}{k} \binom{N-K}{n-k}}{\binom{N}{n}}$$

$$P(X = 1) = \frac{\binom{2}{1} \binom{3}{1}}{\binom{5}{2}} = \frac{2 \times 3}{10} = \frac{6}{10} = \boxed{0.6}$$

$$E[X] = n \frac{K}{N}$$

$$\text{Var}(X) = n \frac{K}{N} \left(1 - \frac{K}{N}\right) \frac{N-n}{N-1}$$

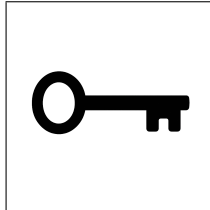


$$\begin{aligned}N &= 25 \\K &= 6 \\n &= 10 \\P(X = 0) &= ?\end{aligned}$$

M

Hyper-geometric Random Variable

M



$$\begin{aligned}N &= 25 \\K &= 6 \\n &= 10 \\P(X = 0) &= ?\end{aligned}$$

$$P(X = k) = \frac{\binom{K}{k} \binom{N - K}{n - k}}{\binom{N}{n}}$$

$$P(X = 0) = \frac{\binom{K}{0} \binom{N - K}{10}}{\binom{N}{10}}$$

$$P(X = 0) = \frac{\binom{6}{0} \binom{19}{10}}{\binom{25}{10}}$$

$$P(X = 0) = \frac{\binom{19}{10}}{\binom{25}{10}}$$

$$P(X = 0) = \frac{92\,378}{3\,268\,760} \approx \boxed{0.0283}$$