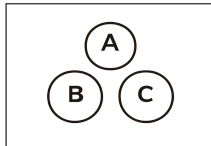


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Discrete Distribution Hyper-geometric

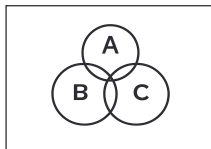


$$N = 5$$

$$K = 2$$

$$n = 2$$

$$k = 1$$

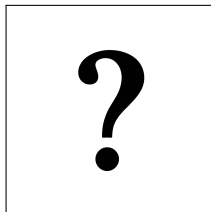


$$P(X = k) = \frac{\binom{K}{k} \binom{N-K}{n-k}}{\binom{N}{n}}$$

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

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

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



$$N = 48$$

$$K = 30$$

$$n = 10$$

$$P(X \leq 8) = ?$$

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Discrete Distribution
Hyper-geometric

$$\begin{aligned}N &= 48 \\K &= 30 \\n &= 10 \\P(X \leq 8) &= ?\end{aligned}$$

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

$$P(X \leq 8) = \sum_{x=0}^8 P(X = x)$$

$$P(X \leq 8) = \sum_{x=0}^8 \frac{\binom{30}{x} \binom{48-30}{10-x}}{\binom{48}{10}}$$

$$P(X \leq 8) = \sum_{x=0}^8 \frac{\binom{30}{x} \binom{18}{10-x}}{\binom{48}{10}}$$

$$P(X \leq 8) \approx \boxed{0.9560}$$