

24

Hyper-geometric Random Variable

R

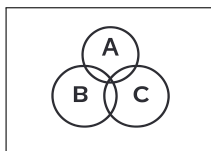


$$N = 5$$

$$K = 2$$

$$n = 2$$

$$k = 1$$

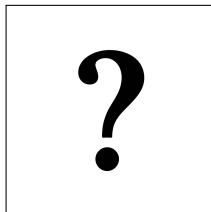


$$P(X = k) = \frac{\binom{K}{k} \binom{N-K}{n-k}}{\binom{N}{n}}$$

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

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

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



$$N = 25$$

$$K = 20$$

$$n = 2$$

$$P(X = 1) = ?$$

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$$N = 25$$

$$K = 20$$

$$n = 2$$

$$P(X = 1) = ?$$

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

$$P(X = 1) = \frac{\binom{20}{1} \binom{5}{1}}{\binom{25}{2}}$$

$$P(X = 1) = \frac{20 \cdot 5}{300}$$

$$P(X = 1) = \frac{100}{300}$$

$$P(X = 1) = \frac{1}{3}$$

$$P(X = 1) \approx \boxed{0.3333}$$