

C

Hyper-geometric Random Variable

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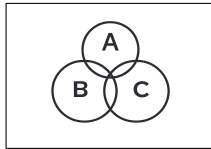


$$N = 5$$

$$K = 2$$

$$n = 2$$

$$k = 1$$



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

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

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

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



$$N = 53$$

$$K = 6$$

$$n = 6$$

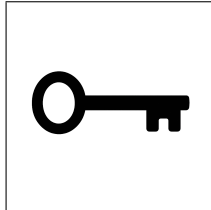
$$X = \{0, 1, 2, 3, 4, 5, 6\}$$

$$PMF = ?$$

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$$N = 53$$

$$K = 6$$

$$n = 6$$

$$X = \{0, 1, 2, 3, 4, 5, 6\}$$

$$PMF = ?$$

$$P(X = x) = \binom{6}{x} \binom{47}{6-x} / \binom{53}{6}$$

$$P(X = 0) = \binom{6}{0} \binom{47}{6} / \binom{53}{6}$$

$$P(X = 1) = \binom{6}{1} \binom{47}{5} / \binom{53}{6}$$

$$P(X = 2) = \binom{6}{2} \binom{47}{4} / \binom{53}{6}$$

$$P(X = 3) = \binom{6}{3} \binom{47}{3} / \binom{53}{6}$$

$$P(X = 4) = \binom{6}{4} \binom{47}{2} / \binom{53}{6}$$

$$P(X = 5) = \binom{6}{5} \binom{47}{1} / \binom{53}{6}$$

$$P(X = 6) = \binom{6}{6} \binom{47}{0} / \binom{53}{6}$$