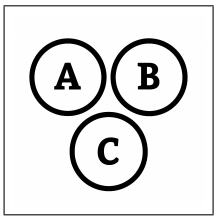
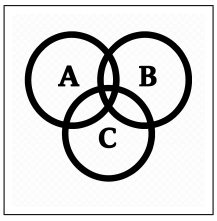
# P Bernoulli Trials P




$n = 2$

$p = 0.50$

$k = 1$

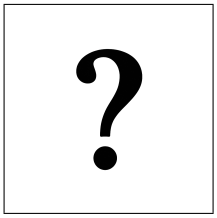



$P(X = k) = \binom{n}{k}(p)^k(1-p)^{n-k}$

$P(X = 1) = \binom{2}{1}(0.50)^1(0.50)^1$

$P(X = 1) = 2 \times 0.50 \times 0.50$

$P(X = 1) = \boxed{0.50}$

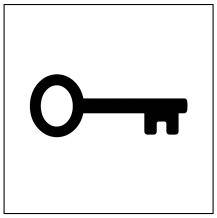



$n = 100$

$p = 0.02$

$P(X = 2|X \leq 2) = ?$

# Bernoulli Trials



$n = 100$
$p = 0.02$
$P(X = 2|X \leq 2) = ?$

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$$P(X = 2 \mid X \leq 2) = \frac{P(X=2)}{P(X \leq 2)}$$

$$P(X = 2 \mid X \leq 2) = \frac{P(X=2)}{P(X=0)+P(X=1)+P(X=2)}$$

$$P(X = 0) = (0.98)^{100}$$

$$P(X = 1) = \binom{100}{1}(0.02)(0.98)^{99} = 100 \cdot 0.02 \cdot (0.98)^{99}$$

$$P(X = 2) = \binom{100}{2}(0.02)^2(0.98)^{98} = 4950 \cdot (0.02)^2 \cdot (0.98)^{98}$$

$$P(X = 0) \approx 0.1329$$

$$P(X = 1) \approx 100 \cdot 0.02 \cdot \frac{0.1329}{0.98} \approx 0.2712$$

$$P(X = 2) \approx 4950 \cdot 0.0004 \cdot \frac{0.1329}{0.98^2} \approx 0.2741$$

$$P(X \leq 2) \approx 0.1329 + 0.2712 + 0.2741 = 0.6782$$

$$P(X = 2 \mid X \leq 2) \approx \frac{0.2741}{0.6782} \approx \boxed{0.404}$$