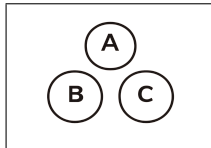
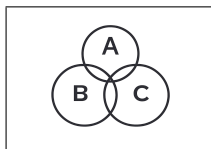


# G Expected Value & Variance Binomial Distribution G

---



$$n = 6$$
$$p = \frac{1}{2}$$



$$E[X] = np = 6 \cdot \frac{1}{2} = \boxed{3}$$

---

$$\text{Var}(X) = np(1-p) = 3 \cdot \frac{1}{2} = \boxed{\frac{3}{2}}$$

---

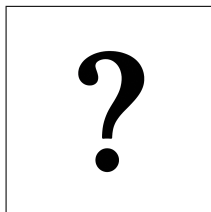
$$E[X^2] = \text{Var}(X) + (E[X])^2$$

$$E[X^2] = \frac{3}{2} + 3^2$$

$$E[X^2] = \frac{3}{2} + 9$$

$$E[X^2] = \boxed{\frac{21}{2}}$$

---



$$n = 3$$

$$p = 0.05$$

$$E[X] = ?$$

$$\text{Var}(X) = ?$$

$$P(X \geq 2) = ?$$

**G**

## Expected Value & Variance Binomial Distribution

**G**

$$\begin{aligned}n &= 3 \\p &= 0.05 \\E[X] &= ? \\Var(X) &= ? \\P(X \geq 2) &= ?\end{aligned}$$

---

$$E[X] = np = 3 \times 0.05 = \boxed{0.15}$$

---

$$Var(X) = np(1 - p) = 3 \times 0.05 \times 0.95 = \boxed{0.1425}$$

---

$$P(X \geq 2) = P(X = 2) + P(X = 3)$$

$$P(X = 2) = \binom{3}{2}(0.05)^2(0.95)^1 = 3 \times 0.0025 \times 0.95 = 0.007125$$

$$P(X = 3) = \binom{3}{3}(0.05)^3(0.95)^0 = (0.05)^3 = 0.000125$$

$$P(X \geq 2) = 0.007125 + 0.000125 = \boxed{0.00725}$$