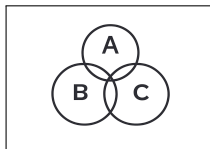
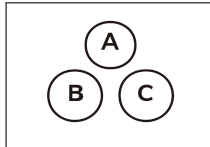


18

Discrete Distribution Uniform Variable



$$X = \{2, 4, 6, 8\}$$



$$P(X = x) = \frac{1}{4}$$

$$E(X) = \sum_x xP(X = x) = \frac{1}{4}(2 + 4 + 6 + 8) = \frac{20}{4} = 5$$

$$E(X^2) = \sum_x x^2P(X = x) = \frac{1}{4}(2^2 + 4^2 + 6^2 + 8^2) = \frac{1}{4}(4 + 16 + 36 + 64) = \frac{120}{4} = 30$$

$$\text{Var}(X) = E(X^2) - [E(X)]^2 = 30 - 25 = 5$$

$$E(3X - 1) = 3E(X) - 1 = 3(5) - 1 = 14$$



$$X = \{-2, -1, 0, 1, 2\}$$

$$Y = |X|$$

$$Y = \{0, 1, 2\}$$

$$P(Y = 0) = P(Y = 1) = P(Y = 2) = ?$$

18

Discrete Distribution Uniform Variable



$$X = \{-2, -1, 0, 1, 2\}$$

$$Y = |X|$$

$$Y = \{0, 1, 2\}$$

$$P(Y = 0) = P(Y = 1) = P(Y = 2) = ?$$

$$P(X = x) = \frac{1}{5}$$

$$P(Y = 0) = P(|X| = 0) = P(X = 0) = \frac{1}{5}$$

$$P(Y = 1) = P(|X| = 1) = P(X = 1) + P(X = -1) = \frac{2}{5}$$

$$P(Y = 2) = P(|X| = 2) = P(X = 2) + P(X = -2) = \frac{2}{5}$$

$$P(Y = 0) = P(Y = 1) = P(Y = 2) \Rightarrow \text{✗}$$