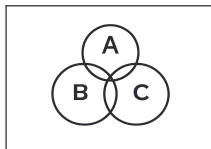
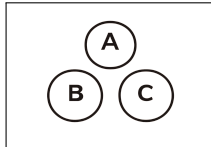


18

Discrete Distribution Uniform Variable

F

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



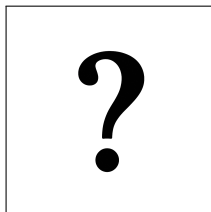
$$P(X = x) = \frac{1}{4}$$

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

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

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

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



$$X = \{0 + 1 + 2 + 3 + 4 + 5 + 6\} \rightarrow |X| = 7$$

$$E[X] = \frac{0+1+2+3+4+5+6}{7} = \frac{21}{7} = 3$$

$$Y = \{0, 1, 2\} \rightarrow |Y| = 3$$

$$P(X < E[X]) = ?$$

18

Discrete Distribution
Uniform Variable

F



$$X = \{0 + 1 + 2 + 3 + 4 + 5 + 6\} \rightarrow |X| = 7$$

$$E[X] = \frac{0+1+2+3+4+5+6}{7} = \frac{21}{7} = 3$$

$$Y = \{0, 1, 2\} \rightarrow |Y| = 3$$

$$P(X < E[X]) = |Y|/|X| = \frac{\#\{0,1,2\}}{\#\{0,1,2,3,4,5,6\}} = \frac{3}{7}$$