

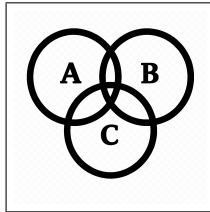
H

Uniform Variable

H



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



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

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

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

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

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



$$X = \{a, \dots, b\}$$

$$E(X) = 6.5$$

$$\text{Var}(X) = 5.25$$

$$a + b = 13$$

$$a = ?$$

$$b = ?$$

H

Uniform Variable

H



$$\begin{aligned}X &= \{a, \dots, b\} \\E(X) &= 6.5 \\Var(X) &= 5.25 \\a + b &= 13 \\a &= ? \\b &= ?\end{aligned}$$

$$\begin{aligned}E[X] &= \frac{a+b}{2} = 6.5 \\a + b &= 13\end{aligned}$$

$$\begin{aligned}N &= b - a + 1 \\Var(X) &= \frac{N^2-1}{12} = 5.25 \\N^2 - 1 &= 5.25 \times 12 = 63 \\N^2 &= 64 \\N &= 8.\end{aligned}$$

$$\begin{aligned}N &= b - a + 1 \\b - a + 1 &= 8 \\b - a &= 7 \\a + b &= 13 \\b - a &= 7 \\2b &= 20 \\b &= 10 \\a &= 13 - b = 3\end{aligned}$$