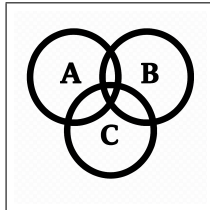




## Variance / SD



$$X = \{1, 2, 3, 4, 5, 6\}$$
$$P(X = x) = \frac{1}{6}$$



$$E(X) = \sum_{x=1}^6 x \cdot \frac{1}{6} = \frac{1+2+3+4+5+6}{6} = \frac{21}{6} = 3.5$$

$$E(X^2) = \sum_{x=1}^6 x^2 \cdot \frac{1}{6} = \frac{1^2+2^2+3^2+4^2+5^2+6^2}{6} = \frac{91}{6}$$

$$\text{Var}(X) = E(X^2) - [E(X)]^2 = \frac{91}{6} - (3.5)^2 = \frac{91}{6} - \frac{49}{4} = \frac{182-147}{12} = \frac{35}{12} = \frac{35}{12}$$

$$\text{SD}(X) = \sqrt{\text{Var}(X)} = \sqrt{\frac{35}{12}} = \sqrt{\frac{35}{12}} \approx 1.708$$

$$\text{Var}(4X + 2) = 16 \text{Var}(X)$$



$$Y = 5 - 2X$$
$$\text{Var}(Y) = ?$$



## Variance / SD



$$Y = 5 - 2X$$
$$\text{Var}(Y) = ?$$

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$$\text{Var}(Y) = \text{Var}(5 - 2X) = (-2)^2 \text{Var}(X) = 4\text{Var}(X)$$