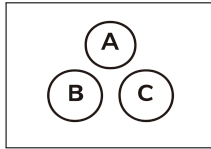


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Discrete Distribution Independant Events

H

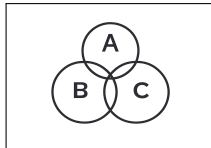


$$S = \{1, 2, 3, 4\}$$

$$A = \{1, 2\}$$

$$B = \{1, 3\}$$

$$C = \{1, 4\}$$



$$P(1) = P(2) = P(3) = P(4) = \frac{1}{4}$$

$$P(A) = P(B) = P(C) = \frac{1}{2}$$

$$A \cap B = \{1\} \rightarrow P(A \cap B) = \frac{1}{4}$$

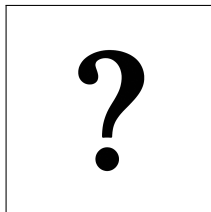
$$A \cap C = \{1\} \rightarrow P(A \cap C) = \frac{1}{4}$$

$$B \cap C = \{1\} \rightarrow P(B \cap C) = \frac{1}{4}$$

$$\frac{1}{4} = P(A \cap B) = P(A) \times P(B) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \rightarrow A \perp\!\!\!\perp B = \text{👍}$$

$$\frac{1}{4} = P(A \cap C) = P(A) \times P(C) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \rightarrow A \perp\!\!\!\perp C = \text{👍}$$

$$\frac{1}{4} = P(B \cap C) = P(B) \times P(C) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \rightarrow B \perp\!\!\!\perp C = \text{👍}$$



$$S = \{(i, j) : i, j \in \{1, 2, 3, 4, 5, 6\}\} \Rightarrow |S| = 36$$

$$A = \{(1, 6), (2, 5), (3, 4), (4, 3), (5, 2), (6, 1)\} \Rightarrow |A| = 6$$

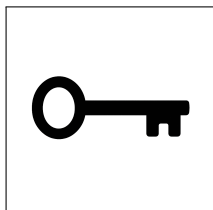
$$B = \{(3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6)\} \Rightarrow |B| = 6$$

$$C = \{(1, 4), (2, 4), (3, 4), (4, 4), (5, 4), (6, 4)\} \Rightarrow |C| = 6$$

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Discrete Distribution Independant Events

H



$$A \cap B = \{(3, 4)\} \Rightarrow P(A \cap B) = \frac{1}{36}$$

$$P(A) \times P(B) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

$$A \perp\!\!\!\perp B = \text{thumbs up}$$

$$A \cap C = \{(3, 4)\} \Rightarrow P(A \cap C) = \frac{1}{36}$$

$$P(A) \times P(C) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

$$A \perp\!\!\!\perp C = \text{thumbs up}$$

$$B \cap C = \{(3, 4)\} \Rightarrow P(B \cap C) = \frac{1}{36}$$

$$P(B) \times P(C) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

$$B \perp\!\!\!\perp C = \text{thumbs up}$$