Classical or Mathematical Probability Examples

Data Science and A.I. Lecture Series

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- Examples of classical probability problems.
- Application of probability rules such as complements and odds.
- Step-by-step solutions to real-world probability problems.

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- Key historical contributions:
  - Galileo: Analyzed dice probabilities.
  - Pascal and Fermat: Created the mathematical theory of probability.
- Applications include games of chance, decision-making, and statistical inference.

Classical Probability Definition

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- **Examples:**
  - Tossing a coin: $P(\text{Head}) = 0.5$.
  - Rolling a die: $P(\text{Even number}) = \frac{3}{6}$.

Example 1: Tossing a Coin Twice

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- **Solution:** $P(E) = \frac{\text{Number of favorable outcomes}}{\text{Total outcomes}} = \frac{3}{4}$.

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- **Problem 2:** Find the probability of drawing a face card.
- **Face Cards:** 12 (Jack, Queen, King in each suit).
- **Solution:** $P(\text{Face}) = \frac{12}{52} = \frac{3}{13}$.

Example 4: Events with Dice

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- **Solution:** $P(A) = \frac{4}{4+3} = \frac{4}{7}$.

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- Complementary Rule: $P(A) + P(\overline{A}) = 1$.
- Odds measure favorability ratios.
- Practice enhances understanding.

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