Classical or Mathematical Probability

Introduction to Probability

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- Limitations of Classical Probability: Biased coin and infinite sample space.

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- The definition of Classical Probability and its core formula.
- Key properties and assumptions of Classical Probability.
- Examples: Tossing a coin and rolling a die.
- Limitations of Classical Probability: Biased coin and infinite sample space.
- A summary and recap of the concept.

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Properties:

- Probability values are always between 0 and 1: $0 \leq P(A) \leq 1$.
- $P(A) + P(\text{not } A) = 1$.

Examples of Classical Probability

Example 1: Tossing a Coin

- Sample Space: $S = \{H, T\}, \quad n(S) = 2$

Example 2: Rolling a Die

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- Event B: Getting an even number $\{2, 4, 6\}$, $m = 3$
- Probability: $P(B) = \frac{3}{6} = \frac{1}{2}$

Key Characteristics of Classical Probability

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- Outcomes must be mutually exclusive.

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- Outcomes must be mutually exclusive.
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Limitations:

- Does not work if outcomes are not equally likely.
- Cannot handle cases with infinitely large sample spaces.

Limitations of Classical Probability

Example: Biased Coin

- If a coin is biased, $P(H) \neq P(T)$, the classical definition fails because the outcomes are not equally likely.

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- This contradicts the actual chances of occurrence.

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Key Takeaways:

- Classical probability provides a simple framework based on symmetry.

Formula Recap:

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Formula Recap:

$$P(A) = \frac{m}{n}$$

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