# Introduction to Bayesian Statistics

## What is Bayesian Statistics?

Bayesian statistics is an approach to data analysis based on Bayes' theorem, which describes the probability of an event based on prior knowledge and new evidence.

## Basic Concepts

* Prior Probability\*\*: Initial belief before new data
* Likelihood\*\*: Probability of observing the data given our hypothesis
* Posterior Probability\*\*: Updated belief after considering new evidence

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| B) = P(B |

## Key Differences from Classical Statistics

1. Incorporates prior knowledge
2. Provides probability distributions rather than point estimates
3. Updates beliefs as new data becomes available

## Applications

* Medical diagnosis
* Machine learning
* Risk assessment
* Climate prediction
* Quality control in manufacturing

## Advantages

* Handles uncertainty well
* Provides intuitive probability interpretations
* Allows for sequential updating of beliefs

## References

* [Bayesian Statistics Tutorial](https://github.com/rasbt/pattern\_classification/blob/master/resources/bayesian\_statistics.md)

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