

Inferential Statistics

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Overview

- 1 Logic of Inferential Statistics
- 2 Central Limit Theorem
- 3 Normal Distribution
- 4 P-Values
- 5 Hypothesis Testing

Paragraphs of Text

There exists some **population**. Within that population, there's some true value of a **parameter** (such as a mean) that we're interested in. We rarely have access to the entirety of that population data, so we usually rely have a subset of that population, known as a **sample**.

The idea of drawing conclusions about the values of parameters of a population based on samples of that population is a process known as **inference**. Thus, **inferential statistics** is the branch of statistics concerned with estimating population parameters from sample data. **Hypothesis tests** are our way of making testable propositions about the population values whose data we have but only a finite sample of.

Normal Distribution

- CLT is what allows to make inferences about a population from a sample
- CLT: This theorem gives you the ability to measure how much the means of various samples will vary, without having to take any other sample means to compare it with
- In fact, we know from the Central Limit Theorem that as sample size of distribution approaches infinite, it converges to a normal distribution, regardless of what the population distribution might be
- As a result, we can make inferences about our sample by comparing it to a hypothetical normal distribution

Normal Distribution

- But what is a normal distribution?
- It's one of the most commonly occurring distributions
- It's a distribution where the mean, median, and mode are equal (or near equal)
- Normal distributions are also known as "bell curves"
- What's so special about the Normal Distribution: the empirical rule (68-95-99.7)
- CLT tells us that even when a population's means are not normally distributed, if repeated samples from that population are taken, then the shape of the accumulated averages will converge to a rough pattern resembling a normal distribution as the number of repeated samples approaches infinite.

Video:

https://www.youtube.com/watch?annotation_id=annotation_550193&feature=iv&src_vid=0zZYBALbZgg&v=eyknGvncKLw

Hypothesis Testing

Video: <https://www.youtube.com/watch?v=0zZYBALbZgg>