

LESSON 11 : Confidence Intervals2. Confidence Interval

→ A confidence interval is a range of values, we are fairly sure our true value lies in.

→ We can use bootstrapping & sampling distributions to build confidence intervals for our parameters of interest.

→ By finding the statistic that best estimates our parameter(s) of interest (say the sample mean or the difference in sample means to estimate the difference in population means), we can easily build confidence intervals for the parameter of interest.

→ How to cut data into 95% confidence interval?

2.5th percentile (non-coffee, 2.5), 97.5th percentile (non-coffee, 97.5)

★ A/B testing is one of the most important to businesses around the world. In this technique you are changing something about your web layout to understand how it impact users. You ideally want to provide a page that leads to more clicks, higher revenue, and/or higher customer satisfaction.



→ Using confidence intervals and hypothesis testing, you are able to provide statistical significance in making decisions.

→ However, it is also important to take into consideration practical significance in making decisions.

Practical significance takes into consideration other factors of your situation that might not be considered directly in the result of your hypothesis test or confidence interval.

Constraints like space, time or money are important in business decisions.

However, they might not be accounted for directly in a statistical test.

→ It is important to understand the way that your sample size & confidence ~~interval~~ level relate to the confidence interval you achieve at the end of your analysis.

Assuming you control all other items of your analysis:

1. Increasing your sample size will decrease the width of your confidence interval.

2. Increasing your confidence level (say 95% to 99%) will increase the width of your confidence interval.



You saw that you can compute:

1. The confidence interval width as the difference b/w your upper & lower bounds of your confidence interval.
2. The margin of error is half the confidence interval width, and the value that you add and subtract from your sample estimate to achieve your confidence interval final results.

## 2. Confidence Intervals (& Hypothesis Testing) vs Machine Learning:

→ Confidence intervals takes an aggregate approach towards the conclusion made based on data, as these tests are aimed at understanding population parameters (which are aggregate population values).

→ Alternatively, machine learning techniques take an individual approach towards making conclusions, as they attempt to predict an outcome for each specific data point.