MODULE 4

Confidence interval is a range of values that describes the uncertainty surrounding an estimate

Two main ways to describe the uncertainty of an estimate:

1. **Confidence interval** (frequentist concept)
2. **Credible intervals** (Bayesian concept)

In practice, data professionals usually select one random sample because repeated random sampling is often expensive and time-consuming. Confidence intervals give data professionals a way to express the uncertainty caused by randomness and provide a more reliable estimate

Margin of error

The range of values above and below the sample

$$Margin\ error = z - score * Standard\ Error$$

Confidence level

- the likelihood that a particular sampling method will produce a confidence interval that includes the population parameter.
- common confidence levels are 90, 95, and 99%. 95% is a popular choice
  90% = 1.645
  95% = 1.96
  99% = 2.58
- the higher the confidence level, the wider the confidence interval.

Steps for constructing a confidence interval:

1. Identify a sample statistic
2. Choose a confidence level
3. Find the margin error
4. Calculate the interval