How do you interpret a confidence interval?

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How do you interpret a confidence interval?

Suppose you calculate a 95% confidence interval for some unknown parameter \( \mu \) (the true price all UNL students spent on books).

**IT IS INCORRECT TO SAY:**

“There is a 95% probability that \( \mu \) (the average price all UNL students spent on books) is within this interval”

**Why is it Incorrect?**

The confidence interval you compute is NOT a random interval and \( \mu \) is a constant (unfortunately unknown to us), thus there is no randomness. In fact, \( \mu \) either falls in that interval or it does not.

**What is the Correct Interpretation?**

“We are 95% confident that if \( \mu \) (the average price all UNL students spent on books) were known, this interval would cover/contain it”

**Note:** The probability refers to the interval containing \( \mu \), not on \( \mu \) being in the interval

**Why is this?**

A 95% confidence interval is not so much a statement about any particular interval, such as (79.3, 80.7), but pertains to what would happen if a very large number of like intervals were to be constructed. That is, from a practical point of view, the 95% gives the fraction of the time, in repeated sampling, that the intervals constructed will contain the target parameter \( \mu \).