2. Confidence Intervals Concept Checks

Confidence Interval Concept Check 1

1/1 point (graded)

Let $X_1, \ldots, X_n \stackrel{iid}{\sim} P_\theta$, where θ is an unknown parameter. You construct a **confidence interval** $\mathcal{I}$ for θ.

Complete the next sentence with one of the options below. The confidence interval $\mathcal{I}$ is ...

- (selected) Random ✔
- Deterministic

Solution:

As defined, a confidence interval $\mathcal{I}$ for an unknown parameter θ is a *random* interval such that the expressions for its endpoints do not depend on θ.
Remark 1: Let's write $a = f(X_1, \ldots, X_n)$ and $b = g(X_1, \ldots, X_n)$ for the endpoints of the random interval $\mathcal{I}$. Note that f and g are functions that do not depend on θ.
In practice, one uses given data (e.g. realizations $x_1, \ldots, x_n$ of iid samples $X_1, \ldots, X_n$) to construct a *realization* $\mathcal{I}_{\text{real}}$ of the confidence interval $\mathcal{I}$:

$$\mathcal{I}_{\text{real}} := (f(x_1, \ldots, x_n), g(x_1, \ldots, x_n)).$$

Such a realization is deterministic.
Remark 2: For this concept, it is important to distinguish the random variable $\mathcal{I}$ (the confidence interval) from its realization $\mathcal{I}_{\text{real}}$, which is formed only after collecting data.

提交 你已经尝试了1次（总共可以尝试1次）

Answers are displayed within the problem

Note: The exercises on the next few pages will be presented in lecture, but we encourage you to attempt these by yourself first.

Confidence Interval Concept Check 2

0/1 point (graded)

Recall that a **realization** of a random variable X is the value that it takes when we observe X. For example, if $X \sim \text{Ber}(1/2)$ and we observe the event $X = 1$, then 1 is a realization (observed value) of the random variable X.

Let $\mathcal{I}, \mathcal{J}$ be some 95$\%$ and 98$\%$ asymptotic confidence intervals respectively for the unknown parameter p. Which of the following statements is true?

不同方法得到的置信区间有一定差异，不一定会包含。

- (selected) Any realization of $\mathcal{I}$ is a **subinterval** of any realization of $\mathcal{J}$. ✘
- Any realization of $\mathcal{J}$ is a **subinterval** of any realization of $\mathcal{I}$.
- None of the above ✔

Solution:

Solution in next video.

提交 你已经尝试了2次（总共可以尝试2次）

Answers are displayed within the problem

讨论

显示讨论

主题： Unit 2 Foundation of Inference:Lecture 5: Delta Method and Confidence Intervals / 2. Confidence Intervals Concept Checks

认证证书是什么？