4. Relating Hypothesis Tests and Confidence intervals

(a)

2.0/2 points (graded)

Consider an i.i.d. sample $X_1, \ldots, X_n \sim \text{Poiss}(\lambda)$ for $\lambda > 0$.

Starting from the Central Limit Theorem, find a confidence interval $I = [A, B]$ with asymptotic level $1 - \alpha$ that is centered about $\overline{X}_n$ using the plug-in method.

Write **barX_n** for $\overline{X}_n$. If applicable, type **abs(x)** for $|x|$, **Phi(x)** for $\Phi(x) = \mathbf{P}(Z \leq x)$ where $Z \sim \mathcal{N}(0,1)$, and **q(alpha)** for q_α, the $1 - \alpha$ quantile of a standard normal variable.)

$\mathcal{I} = [A, B]$ for

$A =$ barX_n - q(alpha/2)*sqrt(barX_n/n) ✔

$B =$ barX_n + q(alpha/2)*sqrt(barX_n/n) ✔

STANDARD NOTATION

Submit You have used 1 of 3 attempts

(b)

2/2 points (graded)

Consider the following hypothesis with a fixed number $\lambda_0 > 0$:

$$H_0 : \lambda = \lambda_0 \quad \text{vs} \quad H_1 : \lambda \neq \lambda_0.$$

Define a test for the above hypotheses with asymptotic level α, and rewrite it in the form

$$\psi = \mathbf{1}\{\lambda_0 \notin J\},$$

for some interval J.

$\mathcal{J} = [C, D]$ for

$C =$ barX_n - q(alpha/2)*sqrt(barX_n /n) ✔

$D =$ barX_n + q(alpha/2)*sqrt(barX_n /n) ✔

Submit You have used 1 of 3 attempts

✔ Correct (2/2 points)

Discussion

Topic: Unit 2 Foundation of Inference:Homework 3: Introduction to Hypothesis Testing / 4. Relating Hypothesis Tests and Confidence intervals

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Question B: Using the solve method

discussion posted 2 days ago by **sean_s_wang**

Basically I followed the process in recitation video #2. The professor did not finish the calculation. So I am just solving a quadratic equation to get the result. It's a little messy but I think it is right. I was a little careless and lost two attempts. Hence I want to double check to see if I am missing anything before my final submission.

Thanks!

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1 response

markweitzman (Community TA)
2 days ago

The question asks for you to use plug-in method - much easier.

"...using the plug-in method."

You are right. I used the wrong terminology. It should be plug-in method (although question B does not specifically say it). I should be able to just use the result of the previous question.

posted a day ago by **sean_s_wang**

The reason I got it wrong is somehow I keep forgetting the square root operation for the the variance λ. Guess I just need to practice more.

posted a day ago by **sean_s_wang**

It wasn't immediately obvious to me either that we weren't supposed to use a different method for part b). I also had a huge messy quadratic.

posted a day ago by **synnfusion**

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