EdX and its Members use cookies and other tracking technologies for performance, analytics, and marketing purposes. By using this website, you accept this use. Learn more about these technologies in the <u>Privacy Policy</u>.





<u>Homework 1: Estimation,</u> <u>Confidence Interval, Modes of</u>

<u>Course</u> > <u>Unit 2 Foundation of Inference</u> > <u>Convergence</u>

> 8. Some examples of convergence

Audit Access Expires Dec 24, 2019

You lose all access to this course, including your progress, on Dec 24, 2019.

Upgrade by Nov 4, 2019 to get unlimited access to the course as long as it exists on the site. **Upgrade now**

8. Some examples of convergence

Rescaled Poisson random variables

2/2 points (graded)

For $n \geq 1$, let X_n be a Poisson random variable with parameter 1/n . Compute

$$\mathbf{P}\left(X_n=0
ight)=egin{bmatrix} \exp\left(-1/\mathsf{n}
ight) \ \end{array}$$

What can you conclude?

 $igcap X_n o 0$ in probability, but nX_n does not converge in probability



 $X_n \to 0$ in probability, $nX_n \to 0$ in probability, and $\mathbb{E}\left[\left(nX_n\right)^2\right]$ converges.



 $igodesize X_n o 0$ and $nX_n o 0$ in probability, but $\mathbb{E}\left[(nX_n)^2
ight]$ does not converge.



STANDARD NOTATION

Submit

You have used 2 of 2 attempts

✓ Correct (2/2 points)

Limit of rescaled Binomials

1.0/1 point (graded)

Let X_n be a binomial random variable with parameters n and $p=\lambda/n$, where λ is a fixed positive number.

Let $k\in\mathbb{N}$ be fixed. As $n\to\infty$, the probability mass function $\mathbf{P}(X_n=k)$ converges to a number that only depends on λ and k. What is the limit?

(If necessary, enter **fact** to indicate the factorial function. For instance, **fact(10)** denotes 10!. Note that **fact(10)** may not be rendered correctly by the parser, but do not worry, the grader will work independently. If you want proper rendering, enclose the factorial by extra parentheses, i.e. (fact(10)).

$$\lim_{n o\infty}\mathbf{P}\left(X_n=k
ight)= extbf{exp(-lambda) * (lambda^k) / (fact(k))}$$

(Food for thought: What can you conclude?)

STANDARD NOTATION

You have used 1 of 3 attempts

Submit

Discussion

Topic: Unit 2 Foundation of Inference:Homework 1: Estimation, Confidence Interval, Modes of Convergence / 8.

Some examples of convergence

Add a Post

Show all posts ▼

by recent activity ▼

Rescaled Poisson random variables

[STAFF] Please consider to extend the due date of course by some days.
Dear Staff I completed 6.431x then enrolled in 14.310x and 18.6501 and now am lacking in the course. Now it seems that am doing course for sake of certificate but I don't wa...

[Staff] I think fact(number or variable) does not properly expressed.
Lentered fact(variable) in the answer, but I think factorial was not properly expressed. Could you please check my answer?

[Food for thought" in the last question
"Food for thought" note in the last question makes me think that we are supposed to derive the solution rather than know it (thank goodness, it was covered in 6.431x). Hats

Learn About Verified Certificates

© All Rights Reserved