Pre-class preparation

Please watch the following video as indicated:

- Video: Invariance of MLEs (looks long, but content after 14:00 is optional!)

- Review Chebyshev's inequality from your MATH/STAT 310 notes!

Objectives

By the end of the day's class, students should be able to do the following:

- State the invariance property of the MLE, both for one-to-one and general functions, and explain why this is a useful property of an estimator.

- State the definition of a consistent sequence of estimators, and prove if a sequence of estimators is consistent or not.

Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 9:00AM:

1. Suppose $X_1, \ldots, X_n | \theta \overset{\text{iid}}{\sim} \text{Poisson}(\theta)$. Explain how you would use the invariance property of the MLE for θ in order to obtain an MLE for the standard deviation of the Poisson(θ) distribution.

2. Probability review: Suppose $X \sim \text{Poisson}(\theta)$ and let $a > 0$. What upper bound does Chebyshev's inequality give for $\Pr(|X - \theta| \geq a)$?

3. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like would you like some more clarification on?