21: LIKELIHOOD RATIO TESTS

Stat250 S25

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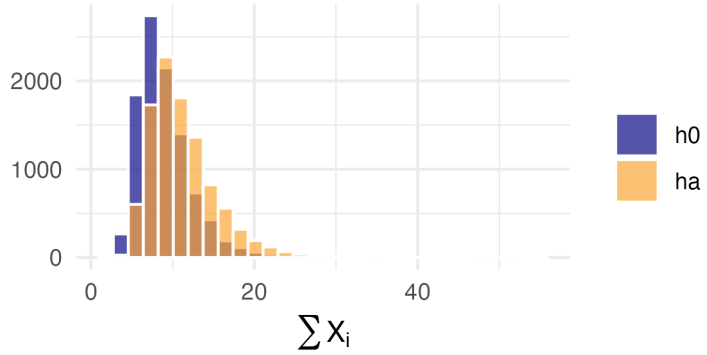
Most of the inference that we've covered so far

Example: Suppose we observe $X_1, ..., X_9 \sim Exp(\theta)$ and are interested in testing $H_0 : \theta = 9$ against $H_A : \theta = 10$.



Likelihood Ratio Test Statistic

Neyman-Pearson Lemma

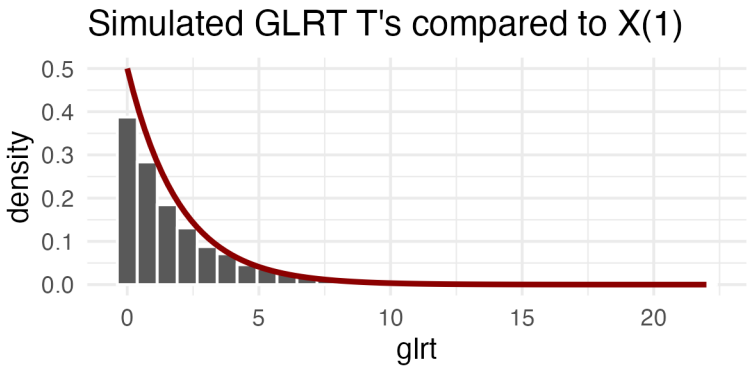
Example: Consider a sequence of n independent Bernoulli random variables $X_1, ..., X_n$. We are interested in the most powerful test for $H_0 : p = .4$ versus $H_A : p = .3$. Derive the form of the rejection region for this test directly. How would you define an α level test in this case?

1 LRT for Composite Hypotheses

Generalized Likelihood Ratio Test Statistic

Example: Suppose we observe $X_1, ..., X_9 \sim Exp(\theta)$ and are interested in testing $H_0 : \theta \leq 8$ against $H_A : \theta > 8$.

Wilk's Theorem



Example: Consider a sequence of n independent Bernoulli random variables $X_1, ..., X_n$. We are interested in the most powerful test for $H_0 : p = .4$ versus $H_A : p < .4$. Derive the form of the rejection region for this test directly. How would you define an α level test in this case?