Lecture 25: Likelihood ratio tests

Another question

Let $X_1, \ldots, X_n \overset{iid}{\sim} Poisson(\lambda)$. We wish to test $H_0 : \lambda = \lambda_0$ vs. $H_A : \lambda \neq \lambda_0$.

Likelihood ratio tests

Back to the Poisson example

Let $X_1, \ldots, X_n \overset{iid}{\sim} Poisson(\lambda)$. We wish to test $H_0 : \lambda = \lambda_0$ vs. $H_A : \lambda \neq \lambda_0$.

Linear regression with normal data

Suppose we observe $(X_1, Y_1), \ldots, (X_n, Y_n)$, where $Y_i = \beta^T X_i + \varepsilon_i$ and $\varepsilon_i \overset{iid}{\sim} N(0, \sigma^2)$. Partition $\beta = (\beta_{(1)}, \beta_{(2)})^T$. We wish to test $H_0 : \beta_{(2)} = 0$ vs. $H_A : \beta_{(2)} \neq 0$.

Asymptotics of the LRT