Feb 10, 2000

Q 1, Suppose we have observed the number of heads x in n independent tosses of a coin. It is known that the probability of heads in a single toss is either $\frac{1}{4}$ or $\frac{3}{4}$. Can you construct an estimator $f_n(x)$ which is unbiased at these two values $p = \frac{1}{4}, \frac{3}{4}$ and has a variance that is lower than that of the usual unbiased estimator $\frac{x}{n}$?

Q 2. Show by direct calculation why the MLE is consistent for the estimation of $p > 0$ in the Gamma family

$$f(p,\, x) = \frac{1}{\Gamma(p)} e^{-x} x^{p-1}$$

of densities on $[0, \infty)$. Can you also prove the asymptotic normality of the MLE in this context?