

Economics 520, Fall 2008

Homework 7

Due Tuesday, November 4 at beginning of class

Note that there is a third note on R posted on the course website.

1. Define an R function to generate a draw for the random variable X_i defined at the beginning of LN10, and generate a histogram of 1000 draws for X_i to verify that your function works as intended.
2. Replicate the three graphs in LN10.
3. Suppose $Y_i \stackrel{\text{iid}}{\sim} N(2, 1)$. Let

$$\bar{Y}_n = \frac{1}{n} \sum_{i=1}^n Y_i.$$

Set $n = 100$, and simulate 1000 draws for $1/\bar{Y}_n$. Compare this to the approximate distribution you derived in Question 4 of HW6. In particular, examine the mean, the variance, and the overall shape of the distribution of $1/\bar{Y}_n$.

4. Suppose that instead of $Y_i \sim N(2, 1)$ in the previous question, we had $Y_i \sim N(0, 1)$. Is the distribution of $1/\bar{Y}_n$ still well-defined? Is the Delta-method approximation still appropriate?
5. Suppose $Z_i \stackrel{\text{iid}}{\sim} \text{Poisson}(\lambda)$, where λ is the unknown parameter. Using a sample of size n , explain how to construct a method-of-moments estimator for λ . Is this estimator unbiased?