ECO 6375-001 Prof. T. Fomby
Econometrics III Fall 2008

EXERCISE 1

Hand in this exercise on Tuesday, September 2, 2008.

Consider the Poisson Distribution:

$$p(y) = \frac{\lambda^y e^{-\lambda}}{y!} \ , \ y = 0,1,2,\cdots \ .$$

a. Derive the mean and variance of this distribution.

b. Assume you have a random sample of $y_1, y_2, \cdots, y_n$. Derive the Maximum Likelihood estimates of the mean and variance of this distribution.

c. Propose unbiased estimators of the mean and variance of this distribution and show they are, in fact, unbiased.

d. Derive the Cramer-Rao lower bound for the estimation of the mean of this distribution.

e. Derive a MVU efficient estimator of the mean of this distribution and show that it is efficient vis-à-vis the Cramer-Rao lower bound.