

Stat 543 Assignment 4 (due Friday February 11, 2005)
Method of Moments, Maximum Likelihood

1. Required Problems: 2.1.2, 2.1.3, 2.1.11, 2.2.10, 2.2.14, 2.2.17, 2.2.23
2. (Required) (Zero-inflated Poisson model) Consider a marginal pmf

$$f(x|\lambda) = pI[x = 0] + (1 - p) \frac{\exp(-\lambda) \lambda^x}{x!} \text{ for } x = 0, 1, 2, \dots$$

(this is a Poisson distribution with some "extra mass" at 0 or alternatively, a mixture of a Poisson distribution and a point mass at 0). Suppose parameters are $p \in [0, 1]$ and $\lambda \geq 0$. Find $E_{p,\lambda}X$ and $E_{p,\lambda}X^2$. Then, for X_1, X_2, \dots, X_n iid with this marginal distribution, find a method of moments estimator for the parameter vector (p, λ) based on the first two sample moments.

3. Optional (not required, but recommended): Problems 2.1.14, 2.2.15, 2.2.16, 2.2.19, 2.2.21