Assignment 3

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1. Suppose that $X_n \sim Exponential(\lambda)$. Suppose that we observe only $Y_n = 1\{X_n \leq 1\}$. Is the population parameter λ_0 identified? Justify your answer.

2. Suppose that X_n has the geometric distribution, i.e. $p_X(x;\pi) = (1-\pi)^{x-1}\pi$ for $x = 1, 2, ..., \infty$.

(a) Show that the population parameter π_0 can be identified.

(b) Derive the log-likelihood function for π.

(c) Derive the maximum likelihood estimator for π_0.

3. The Laplace distribution is given by $f_X(x;\mu,b) = \frac{1}{2b}e^{-\frac{1}{b}|x-\mu|}$. Derive the log-likelihood function for (μ, b).

4. Suppose that $X_n \sim Uniform(-\lambda, \lambda)$. If we observe $Y_n = 1\{X_n \geq 0\}$, is the population parameter λ_0 identified? Justify your answer.