Assignment 5.

Due Oct 23.

1. If $X_1, X_2, \ldots, X_n$ are n independent observations from the uniform distribution on $[\alpha, \beta]$ where $\alpha < \beta$, i.e the common density of $\{X_i\}$ is given by

$$f(\alpha, \beta, x) = \frac{1}{\beta - \alpha}; \quad \alpha \leq x \leq \beta$$

what are the Maximum Likelihood Estimators for α and β?

2. If If $X_1, X_2, \ldots, X_n$ are independent observations from the uniform distribution on $[\alpha - \frac{1}{2}, \alpha + \frac{1}{2}]$ where $\alpha \in R$, i.e their common density is given by

$$f(\alpha, x) = 1; \quad \alpha - \frac{1}{2} \leq x \leq \alpha + \frac{1}{2}$$

Is $\bar{x}$ a consistent estimator ? What is its variance? Is there a better estimator? What is the MLE?