Lecture Pt. 2

estimator

- MOM
- MLE

1. mom

$E(X) = \frac{1}{n} \Sigma x_i$

$E(x^2) = \frac{1}{n} \Sigma x_i^2$

MLE $P(A \cap B) = P(A) \cdot P(B)$

Product of the margin Pdf

Likelihood → Log lik

$\boxed{\text{WS6}}$

① $x_1, x_2, \ldots, x_n \sim U(0, \theta)$

ⓐ mom estimator of θ

$E(x) = \frac{\theta}{2} \approx \frac{1}{n} \Sigma x_i$

$\theta = \frac{2}{n} \Sigma x_i$ → MOM estimator

$E(x^2) \approx \frac{1}{n} \Sigma x_i \approx \frac{\theta^2}{3}$

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(a) Mom estimate of x

$x \sim P(\lambda), e(x) = \lambda$

$E(x) \approx \frac{1}{n} \Sigma x_i \quad \lambda = \frac{1}{n} \Sigma x_i = \bar{x}$

Mom estimm $\lambda = \bar{x}$

(b) Mom estomate of x

$E(x^2) = \lambda + \lambda^2 = \frac{1}{n} \Sigma x_i$

we will not get a unique solution

5) x_1, x_2, X_n random Poisson sample

$P(x_i) = \lambda i = \prod_{i} \frac{e^{-\lambda} \lambda^{x_i}}{\lfloor x_i}$ $\quad \log(L(\lambda))$

$= e^{-n\lambda} \lambda^{\Sigma x_i} \prod_{i=1}^{n} \frac{1}{\lfloor x_i} \quad = e^{-n\lambda} + \lambda \Sigma x_i + \ln C$

$= \frac{\Sigma x_i}{\lambda} = n$

$= \lambda = \frac{1}{n} \Sigma x_i$ MLE

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