AULA 7

COMPARANDO ESTIMADORES + MÉTODO DOS MOMENTOS

$$Y = \max(X_1, \dots X_n)$$

$$\underline{\Pr(Y \leq y)} =$$

$$= \Pr(X_1 \leq y, \; X_2 \leq \dots$$

$$(x_1 \le y,\ x_2 \le y \ldots,\ \underline{x_n \le y})$$

$$\prod_{i=1}^{n} Pr(\underbrace{X_i \le y}_{F(y)}) =$$

$$F_Y(y) = [F_X(y)]^n$$

$$n[\underbrace{F_X(y)}_{U(a,b)}]^{n-1} f_X(y)$$

$$\frac{y-a}{b-a} = \frac{y}{\theta}$$

AULA 8

SUFICIÊNCIA

EXEMPLO DO ASTOLFO

$$\mathcal{E}(\theta) \Rightarrow \begin{cases} E[\theta] = 2 \\ Var(\theta) = SD(\theta) = 1 \end{cases}$$

$$\theta \sim GAMA(\alpha = 2, \beta = 1)$$

$$\xi(\theta) \propto \theta \exp(-\theta)$$

$$\hat{\theta}_B = \underset{\theta|x}{E}[\theta] = \frac{\alpha + n}{\beta + S}$$

$$S = \sum_{i=1}^{n} x_i$$

$$\hat{\theta}_{EMV} = \frac{n}{S} = \frac{1}{\bar{x}_n}$$

$$S_A = S_B = 3.14 \, x \, \pi$$

Poisson

$$X_1 \ldots X_n \sim P(\lambda)$$

$$f(x \mid \lambda) = \frac{\lambda^x e^{-\lambda}}{x!}$$

$$f_n(\mathbf{x} \mid \lambda) = \underbrace{\boxed{\frac{1}{\prod_{i=1}^{n} x_i!}}}_{u(\mathbf{x})} \; \boxed{\lambda^{s} e^{-n\lambda}} \quad v(r(\mathbf{x}), \lambda)$$

$\Rightarrow S = \sum_{i=1} x_i$ é

SUFICIENTE

$P_r(\underline{X} \mid T = t, \theta)$ P/ λ

— " —

$$f(x|\theta) = \begin{cases} \theta x^{\theta-1}, & 0<x<1 \\ 0, & c.c. \end{cases}$$

$$f_n(\underline{x}|\theta) = \begin{cases} \theta^n P^{\theta-1}, & x_i \in (0,1) \\ 0, & c.c. \end{cases}$$

$\theta > 0$

$n \quad \theta - 1$

$\theta \quad \rho^{\theta}$ $\qquad M(x) = 1$

$V(r(x), \theta)$

$\Rightarrow \rho = \prod_{i=1}^{n} x_i$ é

SUFICIENTE p/ θ

$$\hat{\theta}_{EMV} = -\frac{n}{\log \rho}$$

NORMAL

$$L_n(\underline{x}|\theta) = \left(\frac{1}{\sqrt{2\pi\sigma^2}}\right)^n \exp\left(-\frac{\sum(x_i-\mu)^2}{2\sigma^2}\right)$$

$$\underbrace{(2\pi\sigma^2)^{-n/2} \exp\left(-\frac{\sum(x_i-\bar{x})^2}{2\sigma^2}\right)}_{u(\underline{x})} \times \underbrace{\exp\left(-n\frac{(\mu-\bar{x})^2}{2\sigma^2}\right)}_{v(T(\underline{x}),\mu)}$$

σ^2 É CONHECIDA

$\Rightarrow \bar{x}_n$ é suficiente

p/ μ ∎

—— 1. ——

$f_n(\underline{x}|\theta) \propto$

$\sigma^{-n/2} \exp\left(-\frac{\sum(x_i-\mu)^2}{2\sigma^2}\right)$

$\sigma^{2^{-n/2}} \exp\left(-\left[\sum x_i^2 - 2\mu\sum x_i + \right.\right.$

$\tau \sigma^2$

$M(x) = $ $V(r_1(x), r_2(x); \theta)$

$$T_1 = \sum_{i=1}^{n} x_i$$

$$T_2 = \sum_{i=1}^{n} x_i^2$$

$\underline{\mu, \sigma^2}$

$X_1 \sim U(a, b)$

$$f_n(x\mid\theta) = \begin{cases} \frac{1}{(b-a)^n}, & a \le x_i \le b \\ 0, & \text{c.c.} \end{cases}$$

$$\frac{1}{(b-a)^n}$$

$$h(y,z) = \begin{cases} 1, & y \le z \\ 0, & y > z \end{cases}$$

$$m := \min(x_1, \ldots, x_n)$$

$$M := \max(x_1, \ldots, x_n)$$

$$f_n(\underline{x}|\theta) = \frac{h(a, \underline{m})\, h(b, \underline{M})}{(b-a)^n}$$

$v(\underline{v}(\underline{x}), \theta)$

m, M SÃO SUFICIENTES CONJUNTAS

PARA a, b