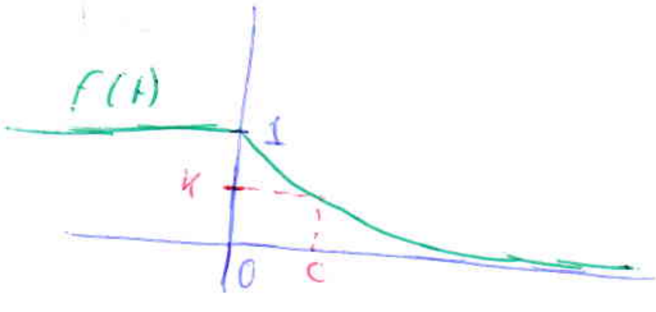
Esto es

$$\lambda(x_1 \dots x_n) = \frac{\sup\limits_{\theta \le 0} \{L(\theta|x_1 \dots x_n)\}}{\sup\limits_{\theta \in \mathbb{R}} \{L(\theta|x_1 \dots x_n)\}} = \begin{cases} \dfrac{L(0|x_1 \dots x_n)}{L(x_{(1)}|x_1 \dots x_n)} & \text{si } x_{(1)} > 0 \\ \dfrac{L(x_{(1)}|x_1 \dots x_n)}{L(x_{(1)}|x_1 \dots x_n)} & \text{si } x_{(1)} \le 0 \end{cases}$$

$$\Rightarrow \lambda(x_1 \dots x_n) = \begin{cases} \dfrac{\frac{1}{\lambda^n} e^{-\frac{1}{\lambda}\sum x_i} e^{\frac{n \cdot 0}{\lambda}} I_{(-\infty, x_{(1)}]}(0)}{\frac{1}{\lambda^n} e^{-\frac{1}{\lambda}\sum x_i} e^{\frac{n x_{(1)}}{\lambda}} I_{(-\infty, x_{(1)}]}(x_{(1)})} & \text{si } x_{(1)} > 0 \\ 1 & \text{si } x_{(1)} \le 0 \end{cases}$$

$$\Leftrightarrow \lambda(x_1 \dots x_n) = \begin{cases} e^{-\frac{n x_{(1)}}{\lambda}} & \text{si } x_{(1)} > 0 \\ 1 & \text{si } x_{(1)} \le 0 \end{cases}$$

$$\lambda(x_1 \dots x_n) = f(x_{(1)}) \quad \text{con} \quad f(t) = \begin{cases} e^{-\frac{nt}{\lambda}} & \text{si } t > 0 \\ 1 & \text{si } t \le 0 \end{cases}$$



Como $e^{-\frac{nt}{\lambda}}$ es decreciente en t

$$RC = \{(x_1 \dots x_n) \mid \lambda(x_1 \dots x_n) \le k\} = \{(x_1 \dots x_n) \mid f(x_{(1)}) \le k\} =$$

$$= \{(x_1 \dots x_n) \mid x_{(1)} \ge c\} \text{ para cierto } c.$$

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