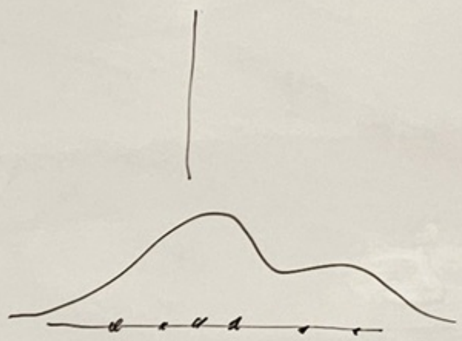
$$\{x_i\}_{i=1}^{N}$$



ucz. mas =
dopas. modelu do danych

$$\psi(x;\lambda) = \lambda e^{-\lambda x}$$

$$p(x;\lambda)''$$

ψ (x; parametry)

KDE

optym

$$L(\lambda) = \prod_{i=1}^{N} p(x_i;\lambda) = \prod_{i=1}^{N} \lambda \exp[-\lambda x_i]$$

O O R O O O R

$$\frac{d}{d\lambda} L = 0 \qquad \frac{d}{d\lambda} \log L = N \frac{1}{\lambda} - N\bar{x} = 0$$

$$\log L = \log \prod_{i=1}^{N} \lambda \exp[-\lambda x_i] =$$

$$= \sum_i (\log \lambda - \lambda x_i) =$$

$$= \sum_i \log \lambda - \sum_i \lambda x_i = \quad \bar{x} = \frac{\sum_i x_i}{N}$$

$$= \log \lambda \left(\sum_{i=1}^{N} 1 \right) - \lambda N \bar{x} =$$

$$\bar{x} = \frac{1}{\lambda}$$

$$\boxed{\lambda = \frac{1}{\bar{x}}}$$

$$\left[\frac{d}{d\mu} f = 0 \quad \frac{d}{d\sigma} f = 0\right]$$

$$K(x) = \frac{1}{\sqrt{2\pi}} \exp\left[-\frac{x^2}{2}\right]$$

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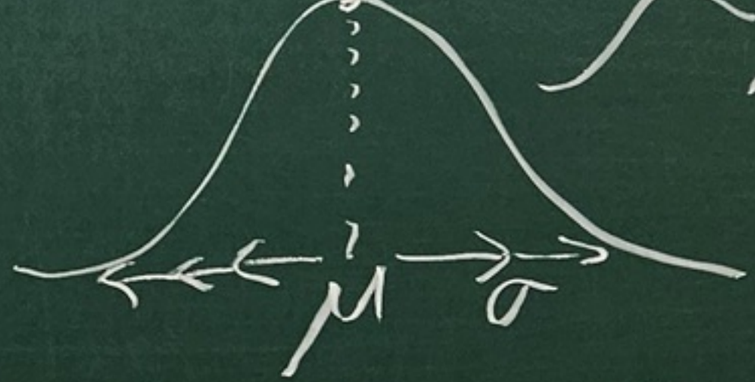
$$\boxed{\frac{x-\mu}{\sigma}}$$

$$f(x;\mu,\sigma) \quad \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$



$$\frac{d}{dx} f$$

$$\frac{\partial}{\partial x} f$$

$$N \log \lambda - \lambda N \bar{x} = \log L$$