Time Series Pattern Recognition Exercize3
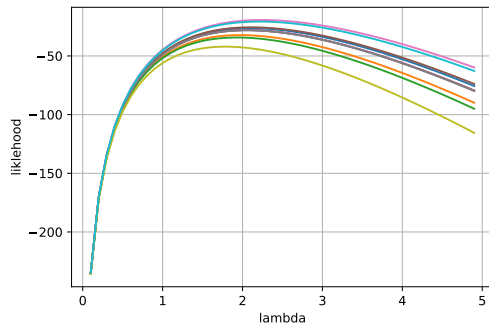
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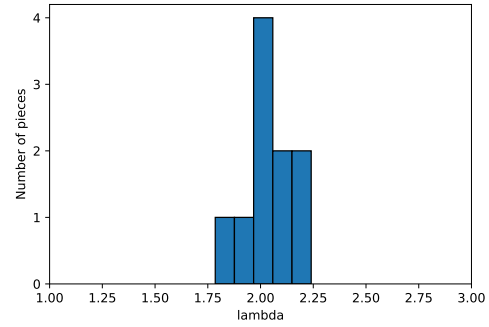
1   Exercize

Predict the values of the parameters using a dataset randomly generated from the exponential distribution of Exp(2). Plot the likelihood function and histogram.

2   Histogram of the maximum likelihood estimate

likelihood

Histogram

3   Estimation

function

$$l(\lambda) = \sum_{i}^{N} \ln \lambda e^{-\lambda x_i} \tag{1}$$

$$= N \ln \lambda - \lambda \sum_{i}^{N} x_i \tag{2}$$

maximum likelihood

$$\left. \frac{\partial l(\lambda)}{\partial \lambda} \right|_{\lambda=\hat{\lambda}} = 0 \tag{3}$$

$$\Leftrightarrow \hat{\lambda} = \frac{N}{\sum_{i}^{N} x_i} \tag{4}$$