

④ (continued)

so maximum likelihood parameter $\hat{\lambda}$:

$$\hat{\lambda} = \underset{\lambda}{\operatorname{argmax}} \ell(\lambda; x_1, \dots, x_n)$$

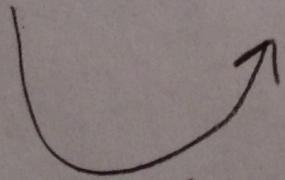
i.e. $\frac{d}{d\lambda} \ell(\lambda; x_1, \dots, x_n) = 0$

$$\Rightarrow \frac{d}{d\lambda} \left[n \ln(\lambda) - \lambda \sum_{i=1}^n x_i \right] = 0$$

$$= \frac{n}{\lambda} - \sum_{i=1}^n x_i = 0 \Rightarrow \lambda = \frac{n}{\sum_{i=1}^n x_i}$$

$$\Rightarrow \boxed{\hat{\lambda} = \frac{N}{\sum_{i=1}^n x_i}}$$

$$\hat{\lambda} = \frac{N}{\sum_{i=1}^n t_i}$$



using original
variable names