



## MITx: 6.041x Introduction to Probability - The Science of Uncertainty



Bookmarks

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## Exercise: ML estimation

(1/1 point)

Let  $K$  be a Poisson random variable with parameter  $\lambda$ : its PMF is

$$p_K(k; \lambda) = \frac{\lambda^k e^{-\lambda}}{k!}, \quad \text{for } k = 0, 1, 2, \dots$$

What is the ML estimate of  $\lambda$  based on a single observation  $K = k$ ? (Your answer should be an algebraic function of  $k$  using standard notation .)

k




Answer: k

Answer:


- ▶ Unit 6: Further topics on random variables
- ▶ Unit 7: Bayesian inference
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- ▼ **Unit 8: Limit theorems and classical statistics**

#### Unit overview


##### Lec. 18: Inequalities, convergence, and the Weak Law of Large Numbers

Exercises 18 due Apr 27, 2016 at 23:59 UTC 

##### Lec. 19: The Central Limit Theorem (CLT)

Exercises 19 due Apr 27, 2016 at 23:59 UTC 


##### **Lec. 20: An introduction to classical statistics**

Exercises 20 due Apr 27, 2016 at 23:59 UTC 

We maximize the logarithm of the PMF, which is  $k \ln \lambda - \lambda - \ln(k!)$ . Setting the derivative of this expression with respect to  $\lambda$  to 0, we obtain  $(k/\lambda) - 1 = 0$ , so that  $\hat{\lambda}_{ML} = k$ .

*You have used 1 of 2 submissions*

[Solved problems](#)[Additional theoretical material](#)[Problem Set 8](#)

Problem Set 8 due Apr 27, 2016  
at 23:59 UTC 

[Unit summary](#)

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