



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



Bookmarks

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## Exercise: LMS and LLMS

(2/2 points)

Suppose that the random variables  $\Theta$  and  $X$  are not independent, but  $\mathbf{E}[\Theta | X = x] = 3$  for all  $x$ . Then the LLMS estimator of  $\Theta$  based on  $X$  is of the form  $aX + b$ , with

 $a =$ 

0



Answer: 0

 $b =$ 

3




Answer: 3

Answer:


The LMS estimator of  $\Theta$  based on  $X$  is of the form  $\mathbf{E}[\Theta | X] = 3$ . This is already linear in  $X$  (with  $a = 0$  and  $b = 3$ ), and therefore it is also the LLMS estimator.

*You have used 1 of 2 submissions*


**Unit overview****Lec. 14:  
Introduction to  
Bayesian inference**

Exercises 14 due Apr  
06, 2016 at 23:59 UTC 


**Lec. 15: Linear  
models with  
normal noise**

Exercises 15 due Apr  
06, 2016 at 23:59 UTC 


**Problem Set 7a**

Problem Set 7a due  
Apr 06, 2016 at 23:59  
UTC 


**Lec. 16: Least  
mean squares  
(LMS) estimation**

Exercises 16 due Apr  
13, 2016 at 23:59 UTC 

**Lec. 17: Linear  
least mean  
squares (LLMS)  
estimation**

Exercises 17 due Apr  
13, 2016 at 23:59 UTC 

**Problem Set 7b**

Problem Set 7b due  
Apr 13, 2016 at 23:59  
UTC 

**Solved problems****Additional  
theoretical  
material****Unit summary**

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