9. Exercise: Possible values of the estimates

Exercise: Possible values of the estimates

2/2 points (graded)

Suppose that the random variable Θ takes values in the interval $[0, 1]$.

a) Is it true that the LMS estimator is guaranteed to take values only in the interval $[0, 1]$?

Yes ✔ **Answer:** Yes

b) Is it true that the LLMS estimator is guaranteed to take values only in the interval $[0, 1]$?

No ✔ **Answer:** No

Solution:

a) The conditional expectation $\mathbf{E}[\Theta \mid X = x]$ is a weighted average of the values of Θ, weighted according to the posterior PDF. A weighted average of values in $[0, 1]$ must lie in $[0, 1]$.

b) On the other hand, there is no such guarantee for the LLMS estimator. You can see this from the picture in the last example. Or you may consider the example where $X = \Theta + W$, where W can take any real value. Then, the term aX can take any real value, and can therefore fall outside the range $[0, 1]$.

提交 You have used 1 of 1 attempt

Answers are displayed within the problem

讨论

显示讨论

Topic: Unit 7 / Lec. 17 / 9. Exercise: Possible values of the estimates