

Course > Unit 5: ... > Lec. 10:... > 3. Exer...

3. Exercise: Conditional PDF

Exercises due Mar 13, 2020 05:29 IST Completed

Exercise: Conditional PDF

2/2 points (graded)

The random variables X and Y are jointly continuous, with a joint PDF of the form

$$f_{X,Y}\left(x,y
ight) = \left\{ egin{aligned} cxy, & ext{if }0\leq x\leq y\leq 1,\ 0, & ext{otherwise,} \end{aligned}
ight.$$

where c is a normalizing constant.

a) Is it true that $f_{X\mid Y}\left(2\mid 0.5
ight)$ is equal to zero?

Yes

✓ Answer: Yes

b) Is it true that $f_{X\mid Y}\left(0.5\mid 2
ight)$ is equal to zero?

No ✓ **Answer:** No

Solution:

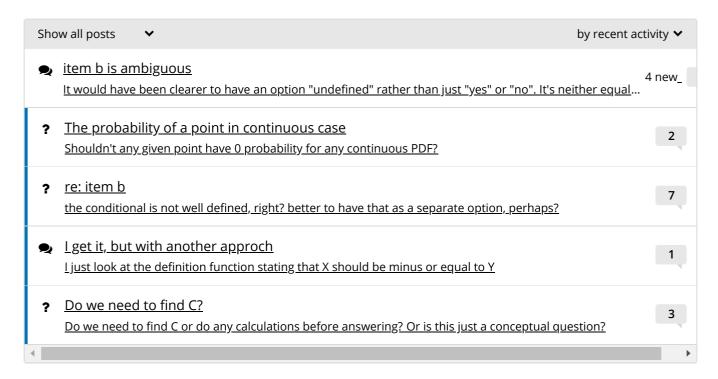
- a) Values of Y around 0.5 have positive probability, so that $f_Y(0.5)>0$, and $f_{X|Y}(2\,|\,0.5)$ is therefore well-defined. But x=2 is outside the range of values of X, and $f_{X,Y}(2,0.5)=0$, from which it follows that $f_{X|Y}(2\,|\,0.5)=0$.
- b) Since y=2 is outside the range of values of Y , we have $f_Y\left(2\right)=0$, and the conditional PDF $f_{X|Y}\left(0.5\,|\,2\right)$ is undefined.

1 Answers are displayed within the problem

Discussion

Hide Discussion

Topic: Unit 5: Continuous random variables:Lec. 10: Conditioning on a random variable; Independence; Bayes' rule / 3. Exercise: Conditional PDF



© All Rights Reserved

