Bookmarks

- Module 1: The Basics of R and Introduction to the Course
- Entrance Survey
- Module 2: Fundamentals of Probability, Random Variables, Distributions, and Joint Distributions
- Module 3: Gathering and Collecting Data, Ethics, and Kernel Density Estimates
- **Module 4: Joint, Marginal, and Conditional Distributions & Functions of Random Variable**

Examples of Conditional Distributions - Quiz

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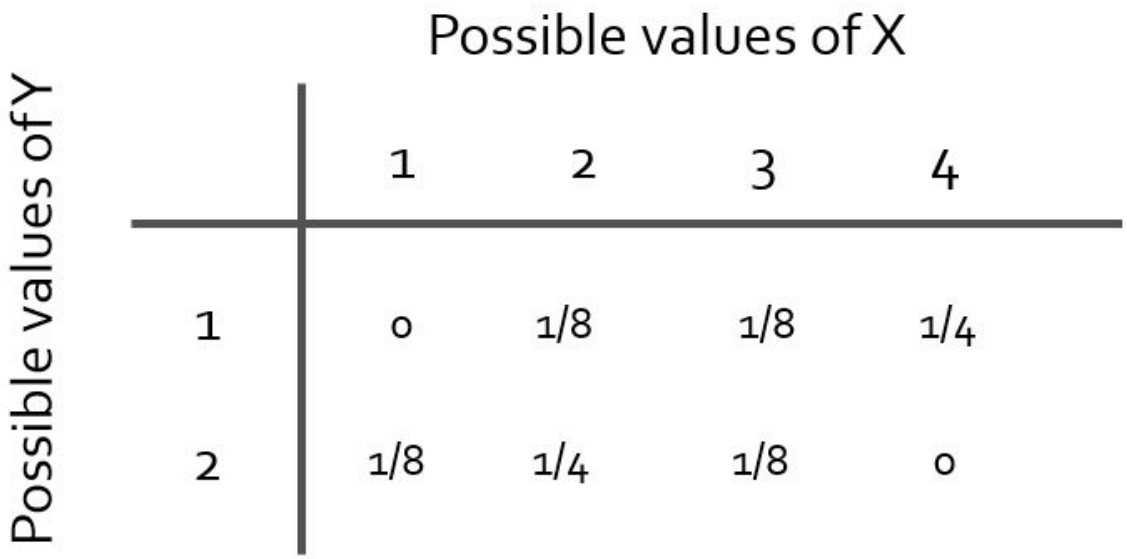
Question 1

1/1 point (graded)

Let's go back to the discrete example that we've been looking at throughout this lecture. Fill in the blanks below.

Round your answer to two decimal places (e.g. if your answer was 0.712, you would round to 0.71 and if your answer was 0.716, you would round to 0.72)



What is the conditional distribution of Y give that X is equal to 2?

$$f_{Y|X}(y=1|x=2) = A$$

$$f_{Y|X}(y=2|x=2) = B$$

Input your response for the value for A

0.33 ✔ **Answer:** 0.33

0.33

Input your response for the value of B

0.67 ✔ **Answer:** 0.67

0.67

What is the conditional distribution of X given that Y is equal to 2?

$$f_{x|y}(x=1|y=2)=C$$

$$f_{x|y}(x=2|y=2)=D$$

$$f_{x|y}(x=3|y=2)=E$$

$$f_{x|y}(x=4|y=2)=F$$

Input your response for the value of C

1/4 ✔ **Answer:** 0.25

$\frac{1}{4}$

Input your response for the value of D

1/2 ✔ **Answer:** 0.5

$\frac{1}{2}$

Input your response for the value of E

1/4 ✔ **Answer:** 0.25

$\frac{1}{4}$

Input your response for the value of F

0 ✔ **Answer:** 0

0

Explanation

To see this, let's walk through the calculation for $f_{X|Y}(x=3|y=2)$. We know from before, or can equally calculate the marginal probability that Y=2, which is $\frac{1}{2}$ or 0.5 by summing up over the possible values of X. The joint probability that x=3 and y=2 comes directly from the table as $\frac{1}{8}$ or 0.125. To calculate the marginal distribution of X evaluated at x=3, divide 0.125 by 0.5 to get $\frac{1}{4}$ or 0.25.

Submit You have used 2 of 2 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

True or False: The conditional distribution of a random variable A given B is equivalent to the unconditional distribution of A so long as A and B are independent.

- (•) a. True ✔
- ( ) b. False

Explanation

This is true. Two variables are independent if the distribution of the first variable conditional on the second variable is equal to the unconditional distribution of the first. Intuitively, if knowing the realization of the second variable tells you nothing about the distribution of the first variable, it must be that the two variables are independent.

Submit You have used 1 of 1 attempts

✔ Correct (1/1 point)

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which is 1/8 + 1/4 = 3/8.

thanks - yeah, i figured it out after rewatching the videos.

posted 6 days ago by **djoond**

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Question explanation

discussion posted 6 days ago by **NaveenVarshan**

I think it would be really helpful to mention the joint PDF (equation) rather than having to look back for clarification.

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In question 1 we had to enter solutions for conditional distributions of the given table (where X takes values from 1 to 4 and Y values from 1 to 2).

I entered fractions as solutions. For example in case of conditional distributions of X=3 given Y=2 I plugged in 1/4 and it marked correct (i.e. it accepted it as if I wrote 0.25). But in case where conditional distribution of Y's given X's I got an incorrect mark! Example for Y=1 given X=2: I entered 1/3 and the correct answer at two decimals is 0.33.

But, since in class also all the answers were given in fractions I left them here as well. Is there a possibility to accept it as it is? (Same for Y=2 given X=2)

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1