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17. Exercise: Random variables with bounded range

Exercises due Feb 28, 2020 05:29 IST Completed

Exercise: Random variables with bounded range

3/3 points (graded)

Suppose a random variable X can take any value in the interval [-1,2] and a random variable Y can take any value in the interval [-2,3].

a) The random variable X-Y can take any value in an interval [a,b]. Find the values of a and b:

$$a=oxed{ullet}$$
 -4 Answer: -4

$$b=oxed{lacksquare} 4$$
 Answer: 4

b) Can the expected value of X+Y be equal to 6?

No ✓ Answer: No

Solution:

- a) The smallest possible value of X-Y is obtained if X takes its smallest value, -1, and Y takes its largest value, 3, resulting in X-Y=-1-3=-4. Similarly, the largest possible value of X-Y is obtained if X takes its largest value, 2, and Y takes its smallest value, -2, resulting in X-Y=2-(-2)=4.
- b) No matter what the outcome of the experiment is, the value of X+Y will be at most 5, and so the expected value can be at most 5.

You have used 3 of 3 attempts

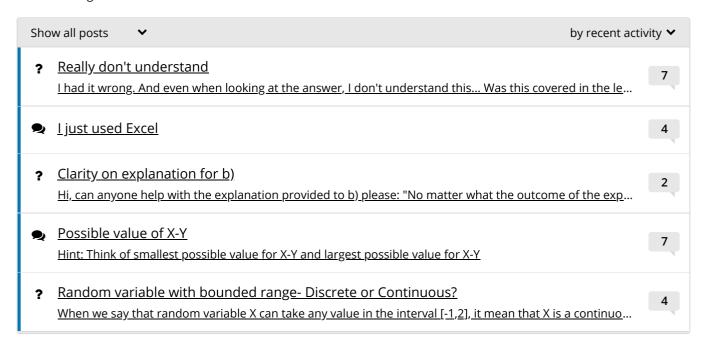


1 Answers are displayed within the problem

Discussion

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Topic: Unit 4: Discrete random variables:Lec. 5: Probability mass functions and expectations / 17. Exercise: Random variables with bounded range



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