



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



Bookmarks

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Unit overview

Lec. 5: Probability mass functions and expectations

Exercises 5 due Mar 02, 2016 at 23:59 UTC

Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s

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Lec. 7: Conditioning on a random variable; Independence of r.v.'s

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Bookmark

Exercise: Random variables with bounded range

(3/3 points)

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 :

 $a =$ 

Answer: -4

 $b =$ 

Answer: 4

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



Answer: No

Answer:

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 1 of 2 submissions

Exercises 7 due Mar
02, 2016 at 23:59 UTC

Solved problems

**Additional
theoretical
material**

Problem Set 4

Problem Set 4 due Mar
02, 2016 at 23:59 UTC

Unit summary

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