



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



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Unit overview

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Exercise: Independence and expectations

(2/2 points)

Let \mathbf{X} and \mathbf{Y} be independent discrete random variables. For each of the following statements, determine whether it is true (that is, always true) or false (that is, not guaranteed to be always true).

1. $\mathbf{E}[\mathbf{X}/\mathbf{Y}] = \mathbf{E}[\mathbf{X}]/\mathbf{E}[\mathbf{Y}]$

False ▾



Answer: False

2. $\mathbf{E}[\mathbf{X}/\mathbf{Y}] = \mathbf{E}[\mathbf{X}] \mathbf{E}[1/\mathbf{Y}]$

True ▾



Answer: True

Answer:

1. There is no reason why this statement should be true, and it is easy to come up with examples where it fails.
2. True. Note that $\mathbf{X}/\mathbf{Y} = \mathbf{X} \cdot (1/\mathbf{Y})$. Furthermore, since \mathbf{X} and \mathbf{Y} are independent, so are \mathbf{X} and $1/\mathbf{Y}$. The validity of the statement follows.

You have used 1 of 1 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

- ▶ Unit 5: Continuous random variables

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