

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

<u>Help</u>



Unit 0: Overview

- EntranceSurvey
- Unit 1: Probability models and axioms
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 Conditioning and independence

Unit overview

Lec. 2: Conditioning and Bayes' rule

Exercises 2 due Feb 2, 2017 20:59 ART

<u>Lec. 3:</u> <u>Independence</u>

Exercises 3 due Feb 2, 2017 20:59 ART

Solved problems

Problem Set 2
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Exercise: Independence of event complements

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Exercise: Independence of event complements

1/1 point (graded)

Suppose that $m{A}$ and $m{B}$ are independent events. Are $m{A^c}$ and $m{B^c}$ independent?

Yes, they are independent ▼

✓ Answer: Yes, they are independent

Answer:

We saw in the previous segment that for any 2 generic events E_1 and E_2 , independence of E_1 and E_2 implies independence of E_1 and E_2^c . In the case of this particular problem, we can apply this result with $E_1=A$ and $E_2=B$ to conclude that since A and B are assumed to be independent, then A and B^c are also independent.

Independence is symmetric, so A and B^c being independent is the same as B^c and A being independent. If we now reuse the generic result with $E_1=B^c$ and $E_2=A$, we can conclude that B^c and A^c are also independent, which by symmetry is the same as A^c and B^c being independent.

To summarize:

A and B independent \Rightarrow A and B^c independent \Rightarrow B^c and A independent \Rightarrow A^c and A^c independent

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You have used 1 of 1 attempt

Correct (1/1 point)

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