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Unit overview

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Exercise: Conditional independence

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Exercise: Conditional independence

2/2 points (graded)

Suppose that A and B are conditionally independent given C. Suppose that $\mathbf{P}(C) > 0$ and $\mathbf{P}(C^c) > 0$.

1. Are A and B^c guaranteed to be conditionally independent given C ?

Yes ✔ **Answer:** Yes

2. Are A and B guaranteed to be conditionally independent given C^c ?

No ✔ **Answer:** No

Answer:

1. We have seen that in any probability model, independence of A and B implies independence of A and B^c. The conditional model (given C) is just another probability model, so this property remains true.

2. This may be true in some special cases, e.g., if A and B both have zero probability. However, it is in general false. Suppose, for example, that events A and B have nonempty intersection inside C, and are conditionally independent, but have empty intersection inside C^c, which would make them dependent (given C^c).

Submit You have used 1 of 1 attempt

✔ Correct (2/2 points)