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

EXERCISE: INDEPENDENCE OF EVENT COMPLEMENTS

(1/1 point)

Suppose that A and B are independent events. Are A^c and 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 $\Rightarrow$ B^c and A^c independent $\Rightarrow$ A^c and B^c independent

You have used 1 of 1 submissions