



13. Exercise: Independence of multiple events

Exercises due Feb 12, 2020 05:29 IST Completed

Exercise: Independence of multiple events

2/2 points (graded)

Suppose that A , B , C , and D are independent. Use intuitive reasoning (not a mathematical proof) to answer the following.

1. Is it guaranteed that $A \cap C$ is independent from $B^c \cap D$?

Yes

✓ Answer: Yes

2. Is it guaranteed that $A \cap B^c \cap D$ is independent from $B^c \cup D^c$?

No

✓ Answer: No

Solution:

1. The occurrence of event $A \cap C$ contains information about A and C , but provides no information on the occurrence of B , D , or for that matter, $B^c \cap D$. Hence we have independence.
2. Event D influences both of the events $A \cap B^c \cap D$ and $B^c \cup D^c$, and therefore introduces a dependence between them. For a more concrete argument, if we are told that event $A \cap B^c \cap D$ occurs, then we know that D occurred. Therefore, D^c did not occur, and this generally reduces the probability of event $B^c \cup D^c$.

Submit

You have used 1 of 1 attempt

i Answers are displayed within the problem



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Question about Explanation for 2, using $D \vee B^c$

Firstly, I hope this is the appropriate place to ask this so as not to give away too much on the problem. I'l...

4

Issues with how 1 answer turned out

5

Rewatch previous lecture snippet - "Independence of a collection of events", until 2 mins 30 secs.

Hi! To get a better understanding of the question, and what it is asking, I would suggest doing the above...

3

Question 1: Can the two intersections be disjoint?

It is my understanding that in order to be independent each event i has to have a nonzero intersection w...

4 new_

Question 2

Can someone please intuitively explain the difference between $B \cap C$ and $B \cup C$? Wh...

3

Hint: don't use Venn diagrams

Apply the logic expressed in the last video.

1

Confounding factors in inference

these exercises really help me understanding a bit better Judea Pearl's concepts of causality and confou...

1

Alter the question for clearing some doubt

I got the correct answer guys but still, I have doubt could you please provide an explanation if following ...

★_Following

2

Intuition or proof that our formal definition implies independence of intersections with complements

Hi everyone, Does anyone have an intuition or proof that our formal definition of independence of a coll...

3

confused with 1.

2 new_ 6

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