305 Lecture 7.2 - Independence

Brian Weatherson

Plan

- A short lecture to introduce a big idea: the notion of independence.

Associated Reading

Odds and Ends, Chapter 6.5

Independence

A and B are independent if (and only if)

$$\Pr(A|B) = \Pr(A)$$

That is, taking things conditional on B doesn't change A.

Ways Independence can Fail

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Epistemic

- B being true could tell you that a source that also predicts A is more reliable than you thought.

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These are consistent, but it does mean be careful. Sometimes assuming independence is like assuming that relativistic considerations aren't important to figuring out whether a bridge will stand up. And sometimes it is like assuming that friction isn't important to figuring out whether a bridge will stand up.

An Odd Instance of Independence

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Question Are A and B independent?

Surprising answer - yes!

For Next Time

- We will look at how to invert conditional probabilities, how to go from a bunch of facts of the form $Pr(A|B) = x$ to facts of the form $Pr(B|A) = y$.