Amsterdam–Beijing Exchange

ILLC and JRC for Logic

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A
imagine

Which facts do we keep the same and which do we change when we imagine hypothetical scenarios?

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What do the words "cause", "because", "reason" mean?

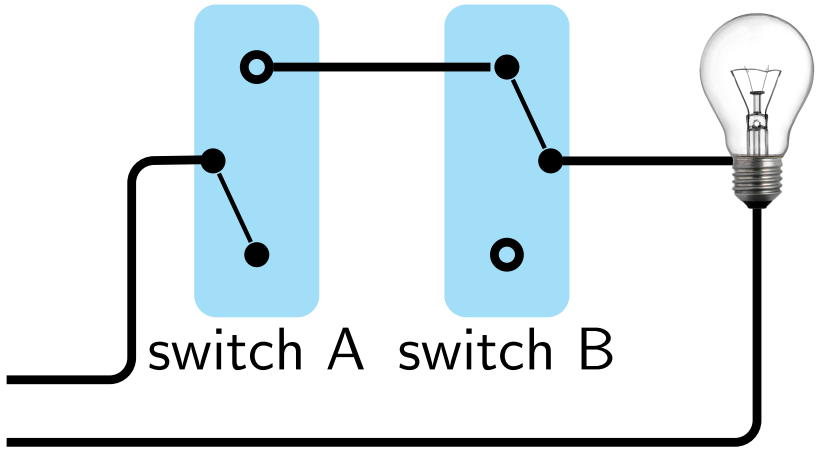

Figure: The light is on just in case both switches are up.

(1) a. The light is off because switch A is down.

b. If switch A were up, the light would be on.

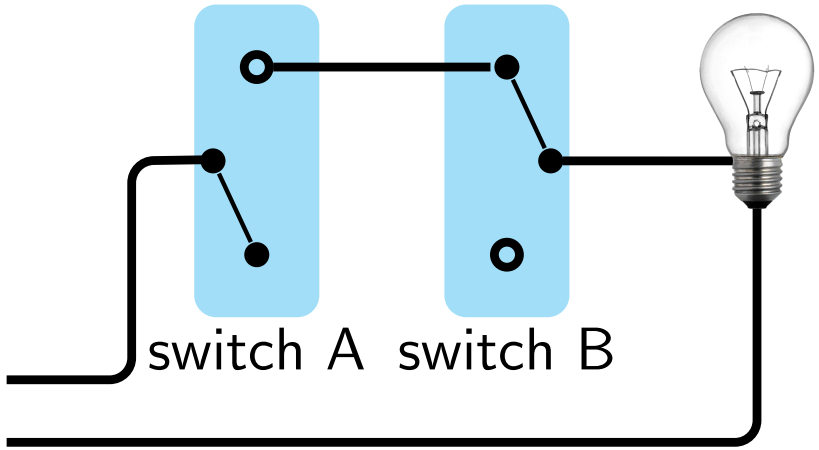

Figure: The light is on just in case both switches are up.

(1) a. The light is off because switch A is down.

b. If switch A were up, the light would be on.

(2) a. Switch B is up. *stays true*

b. The switches are in a different position. *becomes false*

Hypothetical reasoning in decision making:

Model

- A set of available actions
- A probability distribution over hypothetical outcomes
- A measure of the value of each outcome

Causal decision theory:

The agent ought to do action A just in case it maximises expected value:

$$EV(a) = \sum_{\text{outcomes } o} U(o)P(a > o)$$

McHugh (2023) presents a new framework for hypothetical reasoning

- Not based on similarity
- Strictly more general than structural causal models (Theorem 1.6.1)

Substitution: If A and B are logically equivalent, then *If* A, C iff *If* B, C for any C.

Scenario from Fine (2014, p. 328):
There is one poison apple and infinitely many safe apples.

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The antecedents are logically equivalent.

Eve eats infinitely many of the green apples just in case she eats infinitely many of the apples.

Thank you for listening

& looking forward to future collaborations!

References I

- Fine, Kit (2014). Permission and possible worlds. *dialectica* 68 (3), pp. 317–336. DOI: 10.1111/1746-8361.12068.
- McHugh, Dean (2023). Causation and Modality: Models and Meanings. PhD thesis. University of Amsterdam. URL: https://eprints.illc.uva.nl/id/eprint/2243.