Propositional Deductive Reasoning



Deductive Reasoning: $\{P_1, \ldots, P_n\} \models C$ does conclusion *C* follow from premises $\{P_1, \ldots, P_n\} = KB$ (the Knowledge Base)?

Example: *KB* =

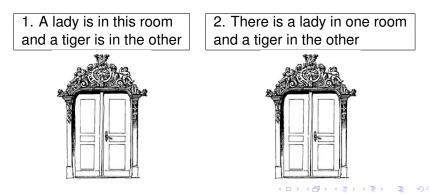
- P1: On weekends, I don't watch tv
- P2: I'm happy when it rains, except in the weekend
- P₃: I'm watching tv but I'm not happy

Can I conclude this?

C: it is not raining

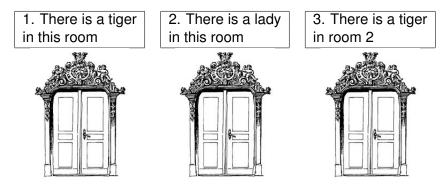
Using propositional logic: an example

- From Lady or the Tiger? And Other Logic Puzzles Including a Mathematical Novel That Features Godel's Great Discovery (Raymond M. Smullyan)
- Behind each door we may have either a lady or a tiger. One sign tells the truth but the other one no. Which door shall we open?



Another variation

• There are one lady and two tigers. At most, one sign tells the truth. Which door shall we open?



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