

Propositional Deductive Reasoning



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

Example: $KB =$

P_1 : On weekends, I don't watch *tv*

P_2 : I'm happy when it rains, except in the weekend

P_3 : 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?

1. A lady is in this room
and a tiger is in the other

2. There is a lady in one room
and a tiger in the other



Another variation

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

1. There is a tiger
in this room



2. There is a lady
in this room



3. There is a tiger
in room 2

