

Übungsblatt 6

Abgabe: Dienstag, 12.06.07 bis 13 Uhr

Exercise 1 Constraint Satisfaction Problems (CSP) (20 Points)

Consider the following logic puzzle: In five houses, each with a different color, live 5 persons of different nationalities, each of whom prefer a different brand of cigarette, a different drink, and a different pet. Given the following facts, the question to answer is “Where does the zebra live, and in which house do they drink water?”

The Englishman lives in the red house.

The Spaniard owns the dog.

The Norwegian lives in the first house on the left.

Kools are smoked in the yellow house.

The man who smokes Chesterfields lives in the house next to the man with the fox.

The Norwegian lives next to the blue house.

The Winston smoker owns snails.

The Lucky Strike smoker drinks orange juice.

The Ukrainian drinks tea.

The Japanese smokes Parliaments.

Kools are smoked in the house next to the house where the horse is kept.

Coffe is drunk in the green house.

The Green house is immediately to the right (your right) of the ivory house.

Milk is drunk in the middle house.

Discuss different representations of this problem as a CSP. Why would one prefer one representation over another?

(Exercise taken from the text book pg. 159)

Exercise 2 Basics on Propositional Logic (20 Points)

- [3 pts.] What does it mean for a logical inference method to be *sound*?
- [3 pts.] What doe does it mean for a logical inference method to *be complete*?
- [6 pts.] State if each of the sentences below are unsatisfiable, satisfiable, or valid.

- $P \Rightarrow Q$
- $P \Rightarrow \neg Q$
- $P \Rightarrow P$
- $P \Leftrightarrow \neg P$
- $P \Rightarrow (Q \Rightarrow P)$

d) [8 pts.] Write out the facts as sentences in Propositional Logic, and use propositional resolution to solve the crime.

1. There are three suspects for a murder: Adams, Brown, and Clark.
2. Adams says "I didn't do it. The victim was old acquaintance of Brown's. But Clark hated him."
3. Brown states "I didn't do it. I didn't know the guy. Besides I was out of town all the week."
4. Clark says "I didn't do it. I saw both Adams and Brown downtown with the victim that day; one of them must have done it."
5. Assume that the two innocent men are telling the truth, but that the guilty man might not be.