TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Theoretical Computer Science, Chair of Automata Theory

Introduction to nonmonotonic reasoning

Winter Semester 2019/20

Exercise Sheet 2

5th November 2019

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Exercise 2.1 We consider again the example $T = (W, D)$ with

$$W = \{german\} \text{ and } D = \left\{\frac{german \ : \ drinksBeer}{drinksBeer}\right\}.$$

Verify that $E = Th(\{german, \neg drinksBeer\})$ is a minimal set of formulas which

- is deductively closed,
- includes the theory's facts, and
- is closed under the application of the defaults.

Exercise 2.2 We consider again Example 3.3 from the lecture: $T = (W, D)$ with $W = \{a\}$ and the defaults $D = \{\delta_1, \delta_2\}$, with:

$$\delta_1 = \frac{a : \neg b}{\neg b} \text{ and } \delta_2 = \frac{b : c}{c}.$$

Why is $\Pi = (\delta_1, \delta_2)$ not a process?

Exercise 2.3 Prove or refute the following claim: if all defaults in Π occur in Π', then $In(\Pi) \subseteq In(\Pi')$ and $Out(\Pi) \subseteq Out(\Pi')$.

Exercise 2.4 Prove Lemma 3.9, i.e. show that the following holds:
let $E' \subseteq E$ and F be a set of formulas closed under some set of defaults D w.r.t. E'. Then F is closed under D w.r.t. E.