



Introduction to nonmonotonic reasoning

Winter Semester 2019/20

Exercise Sheet 4

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Dr. (habil.) Anni-Yasmin Turhan

Exercise 4.1 Reconsider Example 3.23 from the lecture (slide 71). Explain why the defaults had to be turned into semi-normal defaults instead of putting the additional condition in the prerequisite of the defaults.

Exercise 4.2 Show that every process Π of a normal default theory T is included in a closed process Π' of default theory T .

Hint:

For infinite processes use the weaving technique from the proof of Theorem 3.21.

Exercise 4.3 Poole-type default theories¹ have the form $T = (W, D)$, where all defaults $\delta_i \in D$ have the form

$$\frac{\varphi_i : (\beta \wedge \psi_i)}{\psi_i}$$

i.e., all defaults in D have formula β as a conjunct in the justification and the other conjunct as consequence.

Prove or refute the following claims:

- Poole-type default theories always have extensions.
- Poole-type default theories are semi-monotonic.
- Poole-type default theories have orthogonal extensions.

¹Invented by David Poole.