



Introduction to nonmonotonic reasoning

Winter Semester 2019/20

Exercise Sheet 3

14th November 2019

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Exercise 3.1 (a) Devise a default theory $T = (W, D)$ that has three extensions.

(b) Devise a set of additional defaults D' such that $T' = (W, D \cup D')$ has less extensions than T .

(c) Devise a set of additional facts W' such that $T'' = (W \cup W', D)$ has less extensions than T .

Exercise 3.2 Prove Theorem 3.13 (Consistency preservation), i.e. show that the following holds: A default theory $T = (W, D)$ has an inconsistent extension iff W is inconsistent.

Exercise 3.3 Prove or refute the following claim:

Let E be an extension of the default theory $T = (W, D)$. Then E is also an extension of $T' = (W \cup W', D)$ for every subset W' of E .

Exercise 3.4 Give an example which demonstrates that expanding a set of normal defaults by adding normal defaults may increase the number of extensions.

Exercise 3.5 A class \mathcal{C} is called *representationally complete* iff the following property is satisfied: For every default theory T there is a default theory T' in \mathcal{C} such that T and T' have the same extensions. Show that the class of normal default theories is not representationally complete.

Hint:

Consider T with two extensions E and F such that $E \cup F$ is consistent.