



Description Logics

Exercise Sheet 7

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Exercise 24

Prove that the lazy expansion rule \equiv_2 preserves consistency.

Exercise 25

Compare the tableau algorithm (with eager expansion) to the tableau algorithm extended with the \equiv_1 - and \equiv_2 -rules (lazy expansion) by applying both methods to check whether A is satisfiable w.r.t. \mathcal{T} , where

$$\mathcal{T} := \{A \equiv \neg B \sqcap B, B \equiv \exists r. \exists s. (C \sqcap D)\}.$$

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- What is the maximal number of complete ABoxes obtained in the set of ABoxes by eager expansion? What is the minimal number for lazy expansion?
 - What is the maximal number of rule applications by eager expansion? What is the minimal number for lazy expansion?
 - What is the maximal number of assertions in the biggest complete ABox obtained by eager expansion? What is the minimal number for lazy expansion?
 - Give $K(M)$ for all sets M of ABoxes considered in the tableau algorithm with eager expansion.
 - Give $K_{\mathcal{T}}(M)$ for all sets M of ABoxes considered in the tableau algorithm with lazy expansion.