



Description Logic

Winter Semester 2017/18

Exercise Sheet 6

21st November 2017

Prof. Dr.-Ing. Franz Baader, Dr.-Ing. Stefan Borgwardt

Exercise 6.1 We consider the tableau algorithm $\text{consistent}(\mathcal{T}, \mathcal{A})$ for acyclic TBoxes \mathcal{T} , which is obtained from $\text{consistent}(\mathcal{A})$ by adding the \equiv_1 -rule and the \equiv_2 -rule for unfolding \mathcal{T} . Prove that $\text{consistent}(\mathcal{T}, \mathcal{A})$ is a decision procedure for consistency of \mathcal{ALC} -knowledge bases with acyclic TBoxes.

Exercise 6.2 Use the tableau algorithm $\text{consistent}(\mathcal{T}, \mathcal{A})$ for acyclic TBoxes to determine whether the subsumption

$$\neg(\forall r.A) \sqcap \forall r.C \sqsubseteq_{\mathcal{T}} \forall r.E$$

holds w.r.t. the acyclic TBox

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