



Description Logic

Winter Semester 2017/18

Exercise Sheet 11

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Exercise 11.1 Let \mathcal{T}_1 be an \mathcal{EL} -TBox, C, D \mathcal{EL} -concepts, and $\mathcal{T}_2 = \mathcal{T}_1 \cup \{A \sqsubseteq C, D \sqsubseteq B\}$, where A, B are new concept names (as in Lemma 6.1). Show that \mathcal{T}_2 is a conservative extension of \mathcal{T}_1 . Is this still the case after adding $A \sqsubseteq B$ to \mathcal{T}_2 ? What about adding $B \sqsubseteq A$?

Exercise 11.2 Consider the TBox

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

where A, B, C, D are concept names. Use the classification procedure for \mathcal{EL} to check whether the following subsumption relationships hold w.r.t. \mathcal{T} :

- (a) $A \sqsubseteq B$
- (b) $A \sqsubseteq \exists r.\exists r.A$
- (c) $B \sqcap \exists r.A \sqsubseteq \exists r.C$