TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Theoretical Computer Science, Chair of Automata Theory

Logic-Based Ontology Engineering

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Exercise Sheet 10 – Axiom Pinpointing

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Exercise 10.1 We consider the ontology $\mathcal{O} = (\emptyset, \mathcal{T}, \emptyset)$, with labelings of the axioms as follows:

$$\begin{aligned}
\mathcal{T} = \{ \quad & A \sqsubseteq A_1 \sqcap A_2, && (\mathsf{T}_1)\\
& A_1 \sqsubseteq B, && (\mathsf{T}_2)\\
& B \sqsubseteq C, && (\mathsf{T}_3)\\
& A \sqsubseteq \exists r.A, && (\mathsf{T}_4)\\
& \exists r.A_2 \sqsubseteq B \quad \} && (\mathsf{T}_5)
\end{aligned}$$

(a) Transform the given ontology $\mathcal{O}$ into an ontology $\mathcal{O}'$, where the TBox is in normal form. Don't forget the labels!

(b) Compute a pinpointing formula for the consequence $A \sqsubseteq C$ w.r.t. $\mathcal{O}$.