TECHNISCHE UNIVERSITÄT DRESDEN

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

Fuzzy Description Logics

Exercise Sheet 6.2

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Exercise 28

Let $\mathcal{T}$ be the TBox

$$\begin{aligned}\mathcal{T} = \{&\langle B \sqsubseteq \exists r.A, 0.5\rangle,\\ &\langle \exists r.A \sqsubseteq B, 0.9\rangle,\\ &\langle \exists r.B \sqsubseteq B, 0.7\rangle,\\ &\langle A \sqsubseteq B, 0.4\rangle,\\ &\langle A \sqsubseteq \exists r.A, 1.0\rangle\}\end{aligned}$$

Using completion determine the best subsumption degree for $A \sqsubseteq_{\mathcal{T}} B$. Which of the following strategies terminates faster?

a) When several rules are applicable always choose the axiom with the highest degree.

b) When several rules are applicable always choose the axiom with the lowest degree.

Exercise 29

Prove the following statement for the Gödel semantics. Let α, β, γ, q_1, $q_2 \in [0, 1]$. If

$$(\alpha \Rightarrow \beta) \geq q_1$$

and

$$(\beta \Rightarrow \gamma) \geq q_2$$

then

$$(\alpha \Rightarrow \gamma) \geq \min(q_1, q_2).$$