Modeling Error Explanation

Petr Křemen

1 Explanation Algorithms

1. Consider ontology $\mathcal{K} = (\{\alpha_1, \alpha_2, \alpha_3, \alpha_4\}, \emptyset)$:

$$
\begin{aligned}
\alpha_1 &: B \sqsubseteq \forall R^- \cdot \neg A, \\
\alpha_2 &: A \sqsubseteq \forall R \cdot \neg B, \\
\alpha_3 &: C \sqsubseteq A \sqcap \exists R \cdot B. \\
\alpha_4 &: D \sqsubseteq C
\end{aligned}
$$

Find all MUPSes for unsatisfiability of the concept C using either the CS-tree algorithm or the Reiter algorithm. How many runs of the tableau algorithm (for $\mathcal{ALCI}$ in this case) were necessary ? You can check your results using Protégé explanation functionality.

2 Modeling Error Explanations Practically

1. Download and set up the Pellet system (see previous seminar).

2. Download the Pizza ontology.

3. Find all explanations for unsatisfiability of `IceCream` using Pellet system (command `explain`).

4. Explanations can be used not only for unsatisfiability, or consistency, but for any entailment. Try to explain selected axioms in the class hierarchy according to your choice (Pellet switch `--hierarchy`)