

Web Semantics – Exercises session 2

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March 29, 2019

1 Description logics – appetizer

(Odile Papini) Give the representation in description logics of the following concepts:

1. People who have neither a dog nor a cat.
2. Vegetarian people who live in the countryside.
3. People who do not like cats.

2 Description logics – main course: first part

For each of the following concepts, build a suitable ALC concept description, using only the concept names:

`Person, Happy, Animal, Cat, Old, Fish`

and the role name `owns`.

1. happy person
2. happy pet owner
3. person who owns only cats
4. unhappy pet owners who own an old cat
5. pet owners who only own cats and fish

3 Description logics – main course: second part

For each of the concepts formulated as answers of Exercise 2, draw an interpretation.

4 Subsumption

Which of the following statements is true?

1. $A \sqcap \neg A$ is subsumed by B

2. B is subsumed by $A \sqcup \neg A$
3. $A \sqcap \exists r.B$ is subsumed by $A \sqcap \exists r.\top$
4. $A \sqcap \exists r.(B \sqcap C)$ is subsumed by $A \sqcap \exists r.B$
5. $A \sqcap \exists r.(B \sqcup C)$ is subsumed by $A \sqcap \exists r.B$
6. $A \sqcap \forall r.B$ is subsumed by $A \sqcap \exists r.B$
7. $A \sqcap \exists r.B$ is subsumed by $A \sqcap \forall r.B$
8. $A \sqcap \exists r.A \sqcap \forall r.B$ is subsumed by $A \sqcap \exists r.B$

5 Back to FCA

Extract all the formal concepts from the formal context table constructed during the last exercises sessions.