

Description Logics Tutorial

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Knowledge Technologies

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Exercise 1: Prove the satisfiability of the following KB

Woman \equiv Person \wedge Female

Female(ANN)

Person(ANN)

\neg *Woman(ANN)*

Solution: Slides 63-64 from lecture slides

Exercise 2: Prove the satisfiability of the following KB

$Team \sqcap \exists.hasMember.Male \sqcap \exists.hasMember.Female \equiv MixedTeam$
 $MixedTeam(FC)$
 $\forall.hasMember.Male(FC)$

Solution: Slide 54 from lecture slides

Exercise 3: Translate the following Sentences in ALCQ

1. A mother is a female parent
2. A parent is a person with a child
3. A mother of daughters is a mother that has only daughters
4. Mary is mother of Anna and Mina
5. Mary has at least two children

Solutions

Concepts: *Mother, Female, Parent, Person, Daughter, MotherOfDaughters*

Roles: *motherOf, hasChild*

Individuals: *MARY, ANNA, MINA*

1. *Mother* \equiv *Female* \sqcap *Parent*
2. *Parent* \equiv *Person* \sqcap $(\exists \text{hasChild}.T)$ *
3. *MotherOfDaughters* \equiv *Mother* \sqcap $(\forall \text{hasChild}.Daughter)$
4. *motherOf*(*MARY*, *ANNA*), *motherOf*(*MARY*, *MINA*)
5. $(\geq 2 \text{ motherOf}.T)$ (*MARY*)

*Optionally, a Concept "Child" can also be used