

Semantic Web

First Order Logic, Description Logics, Reasoning Excursus

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Express the following statements in First Order Logic:

- 1 Each Employee works for a Company.
- 2 A Company has at least one Employee.
- 3 A Manager is a (special) Employee.
- 4 A Manager must not work for more than two Companies.
- 5 A Company cannot be an Employee at the same time.
- 6 For each Employee that works for a Company we can automatically deduce that the Company employs the Employee.

Given are again the statements from Exercise 1. Express those statements in Description Logic.

- 1 Each Employee works for a Company.
- 2 A Company has at least one Employee.
- 3 A Manager is a (special) Employee.
- 4 A Manager must not work for more than two Companies.
- 5 A Company cannot be an Employee at the same time.
- 6 For each Employee that works for a Company we can automatically deduce that the Company employs the Employee.

Given are the following facts and rules.

Facts:

employs(I3s, daniel).

worksFor(fabian, I3s).

Rules:

$\forall X.\forall Y.(worksFor(X, C) \wedge workFor(Y, C)) \rightarrow colleagues(X, Y).$

$\forall X.\forall Y.(employs(Y, X) \rightarrow worksFor(X, Y).$

- 1 Use SLD Resolution to formally prove that “daniel” and “fabian” are “colleagues”.