

Semantic Web Knowledge Bases Exercise Sheet

We consider the relational database `company` from the lectures, which can be found in the file `company.pl`.

Exercise 1 (Rdf and SparQL) (8 + 5 + 6 + 6 = 25 Points)

- a) Transform the database relations `PROJECT` and `WORKS_ON` to `RDF`. It is sufficient to transform the first tuple of each relation.
- b) Write a query in `SPARQL` to determine the employees and their worked hours from `WORKS_ON`.
- c) Give a refined `RDF` representation of the table `EMPLOYEE` of the same database, where the addresses is split into 3 parts `AREA`, `CITY`, and `STATE`. It is sufficient to transform the first tuple of the relation.

For each tuple, use an intermediate blank node to bundle these three attributes.

- d) Write a query in `SPARQL` to determine (from the splitted addresses) all cities, where the employees live.

Exercise 2 (Datalog and Datalog^{not}) (5 + 5 + 5 = 15 Points)

Given a fact base in DATALOG for the relational database *company*.

a) Define a predicate

```
woman_works_at_plocation(+PLocation, -LastName),
```

in DATALOG to determine the last name (LastName) of a female employee working in a project that is assigned to a special location. Example:

```
?- woman_works_at_plocation('Sugarland', LastName).  
LastName = 'English'.
```

b) Define a predicate

```
same_init_different_sex(-ESSN1, -ESSN2),
```

in DATALOG to determine the ESSN of two employees of different sex, but with the same MINIT. Example:

```
?- same_init_different_sex(ESSN1, ESSN2).  
ESSN1 = 222222222,  
ESSN2 = 666666666.
```

c) Define a predicate

```
different_projects(-ESSN, -PNO)
```

in DATALOG^{not} to determine the ESSN of employees working on a project PNO, on which their supervisor does not work.

You could load, i.e. consult, the file *company.pl* in PROLOG and try your predicates.