

Introduction to the Semantic Web

Work sheet 6

Deadline: Tuesday, November 27, 13:00 a.m.

Question 1

Imagine you found an RDF dataset that you want to use. Instead of *rdf:type*, the property *ex:is_a* is used. You have loaded the data into a triple store. Create a SPARQL CONSTRUCT query that transforms triples with the property *ex:is_a* into triples with property *rdf:type*.

Question 2

Imagine you found an RDF dataset that you want to use. Create a SPARQL CONSTRUCT query that realizes the RDFS entailment pattern *rdfs2*,¹ thus materialize some of the implicit triples that can be entailed under RDFS semantics.

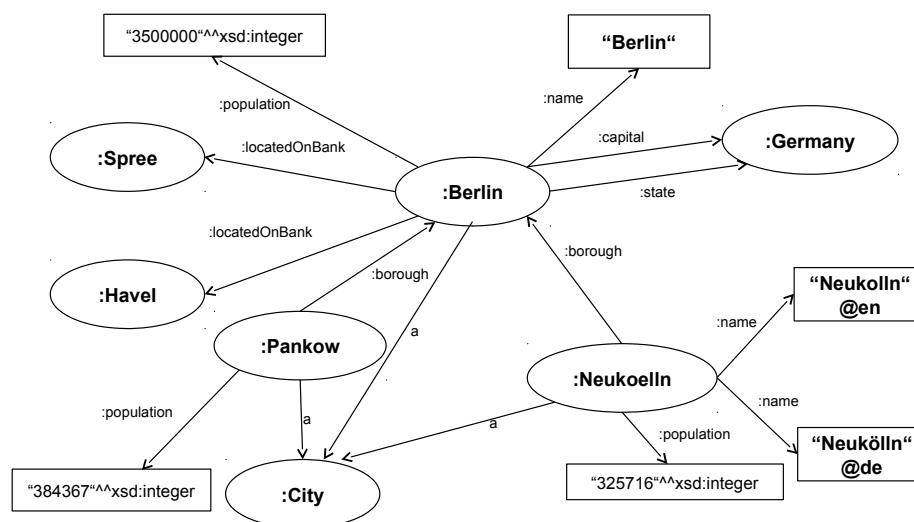
Question 3

Create a small RDF dataset and a SPARQL query on this dataset where using the DISTINCT modifier makes a difference - that means that the result set returned for the query without DISTINCT is different from the result set returned for the query with DISTINCT.

¹See <https://www.w3.org/TR/rdf11-mt/#patterns-of-rdfs-entailment-informative>

Question 4

Given are the graph and the query below. (Task 1) Create the solution sequences $\Omega_1, \Omega_2, \Omega_3$, where Ω_1 is the solution sequence of the first triple pattern and so forth. (Remember that a solution sequence $\Omega = \{\mu_1, \dots, \mu_n\}$ is a set of solution mappings μ_i where a solution mapping $\mu_i = \{(v_1, r_1), \dots\}$ is a set of tuples (v_j, r_j) where v_j is a variable and r_j is a resource from the graph. For example, the solution sequence for the triple pattern $\{?x \text{ a } :City\}$ and the graph below is $\Omega = \{\mu_1, \mu_2, \mu_3\}$ with $\mu_1 = \{(?x, :Berlin)\}$, $\mu_2 = \{(?x, :Pankow)\}$, and $\mu_3 = \{(?x, :Neukoelln)\}$.) Then, (Task 2), evaluate $UNION(\Omega_1, \Omega_2)$, and finally, (Task 3) evaluate $JOIN(UNION(\Omega_1, \Omega_2), \Omega_3)$.



```
SELECT * WHERE {
  { ?x :bouroughh :Berlin . }
  UNION
  { ?x :capital :Germany . }
  ?x :name ?name .
}
```