Integration and Verification Technics Lab

Exercises 1.lab

Using SPARQL queries on an RDF database

Introduction

Perform the following tasks on the workbench of the RDF4J database installed on the virtual machine:

http: // localhost: 8080 / rdf4j-workbench /

You can find the English manual of the OpenRDF Workbench interface here:

http://docs.rdf4j.org/server-workbench-console/#_rdf4j_workbench

Specification for the SPARQL query language:

https://www.w3.org/TR/sparql11-query/

The database used ont he lab contains information about the art treasures stored in the Museum of Fine Arts.

https://datahub.io/dataset/data-szepmuveszeti-hu

0) Load the sample database into OpenRDF Workbench.

- Open the OpenRDF Workbench interface in your browser: http://localhost:8080/rdf4j-workbench/

In the menu select “Repositories and open the database with selecting „Szep”

1) Find the artists/creators in the database.

IOpen RDF Workbench, the "Types" tab contains the types that occur in the database. Clicking on each type will show all RDF statements that contain the selected type.
In RDF, the entity type is expressed by the statement *“?s rdf:type ?o*”, where the subject is replaced by the typed entity and the object (?o) is replaced by the type.
In the Workbench by clicking on the identifiers in the table of listed statements you can see all the statements that contain that entity. This allows you to crawl the relationships in the database.

Find the type to which the creators belong. What data does the database contain about the creators?

2) The database distinguishes between "work of art" and "process of creation". What are these types and how do they relate to each other?

Solve the problem by starting from one creator and traversing on the edges of the graph.

3) How does the database store the size of an artwork? Why?

4) Make a SPARQL query that will find all the creators.

You can run SPARQL queries using the Explore / Query function on the Workbench user interface. At the top of the queries you must specify the prefixes used, that are taken into account by the engine when browsing the database and displaying query results. You can view the prefixes used in the database on the “Explore / Namespaces” page. "rdf" is a built-in prefix, so you don't have to specify it.
For example:

```
PREFIX ecrm: <http://erlangen-crm.org/current/>
SELECT? S {v
? s rdf: type ecrm: E54_Dimension;
ecrm: P90_has_value? v
}
```

You can use "a" as a synonym for "rdf: type".

5) Create a SPARQL query that returns the creators named "Giovanni" (whose names include the string "Giovanni"). The two columns of the resulting table should be the artist's ID and name.

Use the "regex" function to search for a name:
https://www.w3.org/TR/sparql11-query/#func-regex

FILTER regex (? Name, "giovanni", "i")

6) Connect artists with their art works. You must use the results of Task 2).

7) Write a query to find the "Etching" artwork that Rembrandt created.

8) Load a new repository named “SzepDB”

A part of DBpedia has been added to the database of the Museum of Fine Arts. You find now statements from DBPedia that contains relationships about artists. Look for information about Rembrandt, its ID is "<Http://dbpedia.org/resource/Rembrandt>".
The new data was placed in the context of “<dbpedia: actors>”.
Compare the data with the https://en.wikipedia.org/wiki/Rembrandt wikipedia page.

9) In the SzepDB database entities are connected with owl: sameAs relations to the loaded external databases statements. How many links are there to the DBpedia database?

You can distinguish the types of the external links with a FILTER, use the regex() function on the entity identifier. You can get strings from the URI with the str () function

FILTER (regex (str (? Id), "dbpedia"))

10) Select from DBpedia artists who were born in the first half of the 16th century.

Consider the birth year specified by the dbo: birthDate property as xsd:date type and here is how to filter it:

FILTER ("2000-01-01" ^^ xsd: date <=? Date)

11) Write a query to find in the DBpedia database artist with the ID "<http://dbpedia.org/resource/Rembrandt>" and the the titles of his works can be found in the Fine Art Museum data.

Use the owl: sameAs property to find connection between data pieces referring to Rembrandt.

The artist and the creation process is connected by the ecrm: P11_had_participant property, the creation process and the art work is connected by ecrm: P12i_was_present_at.
To query the title of an image:

?thing rdfs:label? title

12) Inquire about the names of artists whom Rembrandt had an impact and has art works in the database of the Museum of Fine Arts.

Use DBpedia “dbo: influencedBy” property.
Write a query to find the titles of all images that are created by these artists.