ESWC2010 Tutorial on Scalable OWL Reasoning for Linked Data

Example

Before you start

- Make sure your computer has at least 1Gb of free hard disk space
- Make sure you have at least version 1.6.0 of the Java runtime environment
  - http://java.sun.com/javase/downloads/
- Download and extract
  - http://www.abdn.ac.uk/~csc280/tutorial/eswc2010/example.zip

Example 1: Lightweight reasoning and linked data

In this example, we will be looking at the effect of lightweight on query answering against a common linked data hub: DBPedia. Our query runs over the DBPedia YAGO (RDFS) ontology. The query we will run is to find all books in Yago. This is written in as:

```
PREFIX yago: <http://dbpedia.org/class/yago/>

SELECT ?book WHERE{
  ?x a yago:Book106410904 .
}
```

To see the effect of running this query using only RDF semantics, use the SPARQL endpoint on the DBPedia server: http://dbpedia.org/sparql

To run the query using the TrOWL lightweight reasoner, open a command prompt (cmd.exe in Windows, Terminal in OSX, any shell in Linux), and `cd` to the directory where you extracted the files.

Under Windows:
```
load.bat -r tutorial1 dbpextract.nt.gz
query.bat -r tutorial1 example1.sparql
```

Under Linux/OSX:
```
./load.sh -r tutorial1 dbpextract.nt.gz
./query.sh -r tutorial1 example1.sparql
```

With no reasoning, 3534 results are returned, with simple reasoning, 9900+ are returned.

Example 2: Approximation Enabled Query Answering over linked data

In this example, we will use music ontology to show the benefit of semantic approximation. We Will run query over the approximated ontology.

The query we will run is to find all performers in the music ontology. This can be written in SPARQL as follows:

```
PREFIX mo: http://purl.org/ontology/mo/

SELECT ?x WHERE{
      ?x a mo:Performer .
}
```

First, we will use a lightweight reasoner to answer this query. Use TrOWL to load the music data set using the streaming RDF parser:

Under Windows:
```
  load.bat -r syntactic music.nt
  query.bat -r syntactic example2.sparql
```

Under Linux/OSX:
```
  ./load.sh -r syntactic music.nt
  ./query.sh -r syntactic example2.sparql
```

Second, we approximate the music ontology (OWL DL) into lightweight ontology (OWL 2 QL) before performs query answering.

Under Windows:
```
  load.bat -r semantic music.owl
  query.bat -r semantic example2.sparql
```

Under Linux/OSX:
```
  ./load.sh -r semantic music.owl
  ./query.sh -r semantic example2.sparql
```

Under semantic approximation, significantly more results are returned and a complete answer is obtained