1 Blazegraph with and without inferences

1.1 without inferences

As in the SPARQL lab session, load in a Blazegraph namespace the drugbank dataset. The namespace must be configured without the support for inferences. Observe the loading time of the set of triples and write a SPARQL query displaying the number of triples in the graph.

1.2 with inferences

Create another Blazegraph namespace but this time configure it with inferences. How can you interpret the evolution of the loading time and the number of triples in the dataset.

You can the next section since the processing of the inference takes quite some time.

Read the page https://wiki.blazegraph.com/wiki/index.php/InferenceAndTruthMaintenance to understand how blazegraph works.

2 RDF4J programming over Blazegraph

You will develop in Java some programs that will use a Blazegraph database. For this, you will use the RDF4J API (an API supporting different services in the context of semantic web application development) from URIs: http://docs.rdf4j.org/ and http://docs.rdf4j.org/javadoc/latest/ Create a java project with Maven and modify the pom.xml to get the following code (adapt the version of Blazegraph):

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
<modelVersion>4.0.0</modelVersion>
<groupId>org.testBlazegraph</groupId>
<artifactId>myBlazegraph</artifactId>
<version>1.0-SNAPSHOT</version>
<dependencies>
  <dependency>
    <groupId>com.blazegraph</groupId>
    <artifactId>bigdata-core</artifactId>
    <version>2.1.4</version>
  </dependency>
  <dependency>
    <groupId>com.blazegraph</groupId>
    <artifactId>bigdata-client</artifactId>
    <version>2.1.4</version>
  </dependency>
</dependencies>
</project>
```

In the following questions, you will write all the queries in the context of a transaction, either using the begin, commit methods of RDF4J and close the connection to the database correctly (cf. close()).

2.1

Use RDF4J without BlazeGraph. Create a first Java class which defines and records a single RDF statement. Then execute a SPARQL query which displays all triples in the repository. Use the RDF4J DiskRW mode of BUFFER_MODE configuration.

2.2

In the following examples, you experiment with the features supported by Blazegraph.

2.2.1

You load the wavesSSSNTboxAbox.n3 dataset (available on the e learning page of the course) in your RD4J program by specifying that you do not want any inferences and you run the following SPARQL query:

```
select? p? o {<http://purl.oclc.org/NET/ssnx/ssn\#QSHH2Dep2>? p? o}
```

2.2.2

You modify the program configuration of the previous question to benefit from inference. You run the same SPARQL query. What are you observing?

2.2.3

You want to manage the changes in your knowledge base. To handle this effectively, you activate TMS mode in the configuration. You remove the fact that the subject http://purl.oclc.org/NET/ssnx/ssn#QSHH2Dep2 is no longer of the type http://purl.oclc.org/NET/ssnx/ssn#SensingDevice. After this deletion, you execute the query of 2.2.1. What do you observe?