Exercises sheet - SPARQL

Use SPARQL queries to solve the following problems. Use Jena ARQ[1], Protégé Snap SPARQL (install in File->Check for plug-ins…) or any generic SPARQL endpoint to execute the queries.

1. Explore the Dataset describing the Periodical Table[2]
   a. find all concepts and properties used in the sets,
   b. guess the schema of the dataset and represent it graphically. Compare your schema with the one generated by Protégé.
2. Find all metallic liquid elements
3. Find all elements which atomic number lies between 85 and 105. Limit the dataset to the 10 records starting from the 3rd record. Order the results by name of elements.
4. Extend the previous query to find whether some not actinides in among the elements.
5. Find all elements which name starts with the letter "C".
6. Use the periodic table ontology to determine the number of elements in actinoid and lanthanoid groups.
7. Compute the number of neutrons for each element Neutrons=AtomicWeight – AtomicNumber. The latter corresponds to the number of protons.
8. Find a non-metallic element with the maximum atomic number.
9. Find all metallic elements which atomic number is greater than the average.
10. Select all group's numbers, which do not have names. Try both variants of negation.
11. Get more information about elements from dbpedia. Use the fact that every element has a name in the ontology and in rdfs:label in dbpedia resource description.
    See for instance "Helium" http://dbpedia.org/page/Helium

[1] http://jena.apache.org/download/ use arq.bat to run the queries. Add the installation_directory/bat (or bin) path to the command path and specify %JENA_HOME% environmental variable with the installation_directory path. ARQ has a nice tutorial http://jena.apache.org/tutorials/sparql.html

[2] http://www.daml.org/2003/01/periodictable/PeriodicTable.owl