Exercise sheet - RDF/RDFS

1. Create a FOAF document for each member of the group. In each document specify the "knows" relation for your group mates. You can use FOAF-a-Matic[1] to generate stubs. Define all Person URIs as http://aau.at/#ZIDLogin for each member of your group, where ZIDLogin is substituted with your login. Use these URIs in your FOAF documents instead of searching. Present your RDF document in RDF/XML and Turtle (aka N3) serialization formats. Please, fill out at least five fields suggested in FOAF-a-Matic input form with personal information. Define at least one FOAF term about yourself that is not suggested in the form (see FOAF vocabulary description[2] for a list of terms).
2. Display your documents as a graph (you can use Protege[3] editor or RDF Validator[4]). Merge all documents of your group into one and present the result as a graph.
3. Model the following sentences in RDF (Turtle). If possible use URI from schemas available at schema.org or GoodRelations:
   a. Peter is a persons
   b. Every student is a person
   c. Jonas and Rosemary are children of Peter, who are 3 and 5
   d. Mark IV is developed by Canon for professional photographers
   e. My friend told me that a person who owns a cat is a woman
4. What is JSON-LD serialization format for RDF? Convert the document obtained in the previous exercise to JSON-LD and use RDF-translator to check your results.
5. Select an HTML page (e.g. some small article from Wikipedia) and introduce RDF annotations in RDFa or JSON-LD formats to it. You can use Google Structured Data Testing Tool (see Documentation for more details).
6. Use Jena[5] command line tools (riot.bat) to convert the student.rdf into Turtle syntax. Explain the meaning of the meaning of the triples. See http://jena.apache.org/documentation/io/ for help.
7. Use Jena RDFS inference engine to obtain RDFS entailments (infer.bat) of student.rdf and explain why these triples are derived using common sense reasoning.
8. Apply inference to axel.rdf using FOAF as RDFS vocabulary.
   Example (Windows PC connected to the Internet):
   run cmd.exe, go into a directory where axel.rdf is saved and run:
   infer.bat --rdfs=http://xmlns.com/foaf/0.1/ axel.rdf
   Select five triples that are not in the original document and explain them using FOAF vocabulary definitions http://xmlns.com/foaf/spec/

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[1] http://www.ldodds.com/foaf/foaf-a-matic.html
[2] http://xmlns.com/foaf/spec/
[3] https://protege.stanford.edu/products.php#desktop-protege
[4] http://www.w3.org/RDF/Validator/ do not forget to make an appropriate selection in "Triples and/or Graph"
[5] Download Jena from http://jena.apache.org (works with Java 6 of higher) and register the JENA_ROOT=Jena/Path environmental variable

9. Create an RDFS ontology describing the following part of a domain that describes pets.
    - All dogs are animals.
    - Parent is a relationship defined for animals.
    - All animals related as parents are also relatives.
    - Jake states that dogs are carnivores.
    - Wikipedia has also a definition of a dog.

    Use derivation rules presented in the lecture to obtain simple entailments of the following RDF document. Use RDFS axiomatic and valid triples, i.e. statements that are always true for every RDFS document (see Section 9 of RDFS 1.1 Recommendation[6]), to obtain as much entailments as possible.

10.
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ex:Mike a foaf:Person .
ex:Mike ex:friend ex:Jerry .
ex:friend rdfs:subPropertyOf foaf:knows .
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11.
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ex:Megan ex:hasParent ex:Mike .
ex:hasParent rdfs:domain ex:Person .
ex:Person rdfs:subClassOf ex:Agent .
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[6] http://www.w3.org/TR/2014/REC-rdf11-mt-20140225/Overview.html#rdfs-interpretations