YTÜ-CE: Semantic Web Graduate Course
Homework Assignment - 3
Fall 2016

This homework assignment asks you to write in OWL language, an ontology document that best specify the ontology you have created in Homework Assignment 2. You are asked to expand on this ontology to satisfy the requirements of this assignment.

1. **Details & Requirements**
   - In total, your OWL ontology should have at least 10 classes.
   - You should have at least 5 object property elements.
   - The object properties you define should have TransitiveProperty, SymetricProperty and FunctionalProperty features.
   - When you define your classes you should use at least one unionOf and one intersectionOf Boolean combinations.
   - When you define your classes you should use owl:allValuesFrom, owl:hasValue, owl:someValuesFrom property restrictions on the anonymous classes that you will be create.
   - Your OWL classes must include an example of nested class descriptions. (hint:Restriction within another Restriction)
   - Your OWL classes must have owl:minCardinality and owl:maxCardinality restrictions.
   - In your OWL ontology, you must use restrictions such as domain and range restrictions on object properties.
   - You will create at least 5 different instances of your OWL ontology. Each instance will be separate RDF document. Each instance should include 5 resources, each is instance of the Classes defined in your OWL ontology. Your instances must cover all classes of your ontology.
   - You will use Protégé (http://protege.stanford.edu/download/protege) to create your OWL ontology.
   - You will use Jena (https://jena.apache.org) semantic web libraries (particularly ontology and inference libraries) to do some processing on your OWL instances.
     - You will use Jena libraries to read your OWL ontology and write all class hierarchy into a text file.
     - You will read all RDF triples in the OWL instances and OWL ontology, then combine them in one big OWL instance. You will then write the list of all

statements from your combined OWL to a file.

- You will use Jena inference library and validate your OWL ontology and instances.
- You will create an Inference Model from your ontology and write the inferred triples created by the Inference Model into a file.
- You will apply three SPARQL queries on you Inference Model and write the results into a file.

- Only Java language is allowed.

2. **Implement your application and write a 1 page report**
   - Your report should include
     - Brief explanation of your implementation and information on how to compile and run.
     - Experiences and discussion.

   - How to submit
     - A. Please submit the files in .zip format with the filename corresponding to your student id.(e.g TP_StudentID.zip) via email to the assistant instructor (ytublm5151@gmail.com) Email Title : [OWLOntologyAssignment] Your Student ID, Your Name
     - Zip file should include your all source codes as an eclipse project where all the libraries are included and path to libraries are set properly.
     - **Due Date: Sunday, 11/12, 11:59PM**

3. **Late Assignment Policy**
   - A grading penalty will be applied to late assignments. (10% penalty up to the first 24 hours, 20% for 24 to 48 hours, with no credit received after that)