CSC 4750/6750 Semantic Web

Assignment 2, Due on February 20th, 2017

1. [40 points] Use RDFS to write a small ontology (probably the smallest ontology in the world) to describe the following concepts and relationships:

- A `Person` is a class, a `Student` is a subclass of `Person`, and a `Professor` is also a subclass of `Person`.
- A `Course` is a class.
- `knows` is a property. `advises` is a sub-property of `knows`, and it is used to describe the fact that a `Professor` advises a `Student`.
- `takes` is a property, and it is used to describe the fact that a `Student` takes a `Course`.
- `teaches` is a property, and it is used to describe the fact that a `Professor` teaches a `Course`.

The following lines are given to you as a start so that you can finish your ontology:

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
         xmlns:u="http://www.example.org/univ#"
         xml:base="http://www.example.org/univ">

<rdfs:Class rdf:ID="Person" />

<!-- your work continues from here  -->
```

Once you have finished your ontology, use the validator you have used in Assignment 1 to validate your work. Submit a screen copy to show your validation result. Again, here is the URL of the validator:

http://www.w3.org/RDF/Validator/

2. [20 points] Given the tiny ontology you have created in Problem #1, you can now use the terms in this ontology to describe some facts in the real world. Create RDF statements to describe the following:

- Peter is a `Professor`, and he `teaches` course CS201 and CS201, he also `advises` Sam.
- Sam is a `Student`, he `takes` course CS101 and course CS201.

Again, the following lines are given to you as a start, so you can continue your work:

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
```

```
         xmlns:u="http://www.example.org/univ#"
         xml:base="http://www.example.org/univ">

<u:Professor rdf:ID="Peter">

<!-- your work continues from here  -->
```

Once you are done, combine these new statements with the ontology statements you have created in Problem #1, in other words, collect all the statements and make them into one single document. Validate this new RDF document using the same validator, and submit a screen copy to show your validation result.

3. [10 points] Using the RDFS reasoning rules, determine what triples can be inferred from the combined statements in Problem #1 and #2. Give your answer by listing these additional RDF triples (write at least 4 statements).