COMP 872 Social Semantic Web Fall 2014 Assignment 2

Due by Monday, Sept. 22 at 11:00 PM

All solutions for this assignment will be in RDF/XML. Each problem details which features of this serialization to use.

Assume that some school uses the URI **`http://www.school.org/faculty/`** for its faculty, identified by id numbers; Mr. Bush has id number 37 and Dr. Schmidt has id number 14. Also, the school uses the URI **`http://www.school.org/terms/`** for terms it defines; these terms include **`Student`** (a class), **`mentee`** (a property), and **`studentid`** (a property), all with the obvious meanings. These terms also include **`acadadvisor`** (academic advisor: a student may have an academic advisor as well as a mentor). Assume that the conventional prefixes associated with these URIs are **`faculty`** and **`schoolterms`**, respectively.

You'll use the following standard Qname prefixes.

`rdf` for **`http://www.w3.org/1999/02/22-rdf-syntax-ns#`**

`foaf` for **`http://xmlns.com/foaf/0.1/`**

Use the FOAF **`name`** property for names.

1. Express the following in RDF/.XML.

Mr. Bush has as a mentee a student named Bill Jones, whose student id is 34765. He also has as a mentee a student named Fred Smith, whose student id is 34767 and whose academic advisor is Dr. Schmidt.

This involves blank nodes for Bill and Fred. Use the "primitive" form for bnodes (see slide 20). A statement with a bnode as subject is written using an **`rdf:Description`** element that has an **`rdf:nodeID`** attribute with the bnode identifier as its value, and a statement with a bnode as object is written using a property element that has an **`rdf:nodeID`** attribute with the bnode identifier as its value. The bnode identifier will be the same in the two positions when the same bnode occurs as subject and object. Specify integer type (as per XML Schema) for student ids using the standard **`xsd`** entity (which you must define in a document type declaration). Finally, express all properties as property elements, that is, in the form

```
<property rdf:resource="object URL" />
```

or

```
<propery>Object</property>
```

2. Rewrite the answer to problem **1** using **`rdf:parseType`** so that the **`rdf:Description`** tags for bnodes may be omitted (see slide 22). (Still use property elements.)

3. Rewrite the answer to problem **2** again so that the bnode for Bill is represented by an empty property element that "absorbs" the bnode and uses property attributes (i.e., all properties are expressed as attributes of the **`schoolterms:mentee`** element). (See slide 24.) Do not specify a datatype for student ids in this solution and do not include a definition for the entity **`xsd`**.

4. Suppose the terms defined by the school also include **`Course`** (a class) and **`taught-by`** (a property) and that Mr. Peters has faculty id 42. Suppose also that the school's catalogue of courses is associated with the URI **`http://www.school.org/courses`** and includes the following courses

- English Literature, taught by Mr. Bush (with, by the way, course identifier 101)
- American Literature, taught by Mr. Peters (with, by the way, course identifier 201)

Write an RDF/XML document recording this information (i.e., the name and teacher of both courses) using the **`xml:base`** attribute, the **`rdf:ID`** attribute, and fragment identifiers "course101" and "course201" for the courses. (See slides 50 ff.) Use the abbreviation for typed nodes: instead of **`rdf:Description`** elements, you'll have **`schoolterms:Course`** elements (see slide 63).

5. Now, the school has also defined the term **`prereq`** (a property) for one course being a prerequisite for another. Write an RDF/XML document that indicates that (referring to the courses in problem **4**) English Literature is a prerequisite for American Literature and that a course identified by fragment identifier "course100" in the full document above (but not part of the shortened document that's the solution to problem **4**) is a prerequisite for English Literature. (The **`xml:base`** attribute won't help here.) Again use the abbreviation for typed nodes for the courses.