Semantic Web

Assignment 5

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Some of the tasks may require you to do additional research extending the lecture. Please keep the citation rules in mind.

For all the assignment questions that require you to write a code, make sure to include the code in the answer sheet, along with a separate python file. Where screen shots are required, please add them in the answers directly and not as separate files.

Please submit your XML solutions in separate files.

Team Name: XXXX
Team Members: XXXX

1 OWL Ontology

Consider the following statements:
- Tiger is a sub-class of class Animal.
- Predator is a class whose members are exactly those animals who eat other animals.
- MatureTiger is a class whose members are exactly those tigers that are older than 4 years.
- Mature tigers may have children who are also tigers.

1.1 Write an OWL ontology that models the statements.

Start:

```
<?xml version="1.0" encoding="utf-8" ?>
< rdf:RDF
  xmlns = "http://www.example.org/"
  xmlns:rdf = "http://www.w3.org/1999/02/22-rdf-syntax-ns"
  xmlns:xsd = "http://www.w3.org/2001/XMLSchema"
  xmlns:rdfs = "http://www.w3.org/2000/01/rdf-schema"
  xmlns:owl = "http://www.w3.org/2002/07/owl#" >
```

1.2 The statements above can be seen as a T-Box. Your task is to define a simple A-Box of a tiger and model it in OWL according to your ontology from 1.1. Two or three statements are enough for the A-Box.

2 RDFS

Consider the following RDF/XML document containing information about a patient:

```
 1: <?xml version="1.0" encoding="utf-8" ?>
 2: <rdf:RDF
 3:   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
 4:   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
 5:   xmlns:xo="http://example.org/ontology#"
 6:   xmlns:x="http://example.org/resource/">
 7:   <rdf:Description
 8:         rdf:about="http://example.org/resource/p3123">
 9:     <rdf:type
10:       rdf:resource="http://example.org/ontology#MalePatient"/>
11:     <xo:name>Gerard Williams</xo:name>
12:     <xo:age>63</xo:age>
13:     <xo:nextOfKin>
14:       <xo:Person
15:         rdf:about="http://example.org/resource/p1231">
16:         <xo:name>Annabelle Williams</xo:name>
17:       </xo:Person>
18:     </xo:nextOfKin>
19:     <xo:medicalStatus>in intesive care</xo:medicalStatus>
20:     <xo:treatedBy>
21:       <xo:Physician
22:         rdf:about="http://example.org/resource/m2443">
23:         <xo:name>Caroline Smith, MD</xo:name>
24:       </xo:Physician>
25:     </xo:treatedBy>
26:    </rdf:Description>
27: </rdf:RDF>
```

2.1 Specify a RDFS vocabulary for the above RDF.
Start:

```
<?xml version="1.0" encoding="utf-8" ? >
<! DOCTYPE rdf:RDF [
<! ENTITY xsd "http://www.w3.org/2001/XMLSchema#"> ]>
< rdf:RDF
  xml:base = " http://example.org/ontology /"
  xmlns:rdf = "http://www.w3.org/1999/02/22-rdf-syntax-ns"
  xmlns:rdfs = "http://www.w3.org/2000/01/rdf-schema">
```

3 RDFS and OWL

Consider the following scenario:

In our university, courses can be lectures or tutorials. Assignments are part of courses. Courses are organized by teachers. Teachers can be either professors or tutors. Professors teach lectures, and tutors only teach tutorials.

3.1 Depict the corresponding RDFS according to the given scenario.

3.2 Write an OWL ontology that models the scenario.

Start:

```
<?xml version="1.0" encoding="utf-8" ? >
< rdf:RDF
  xmlns = "http://www.example.org/"
  xmlns:rdf = "http://www.w3.org/1999/02/22-rdf-syntax-ns"
  xmlns:xsd = "http://www.w3.org/2001/XMLSchema"
  xmlns:rdfs = "http://www.w3.org/2000/01/rdf-schema"
  xmlns:owl = "http://www.w3.org/2002/07/owl#" >
```

Important Notes

Submission

- Solutions have to be submitted to the OLAT repository Submission in the respected folder.
- The name of the group and the names of all participating students with matriculation numbers must be listed on each submission.
- Solution format: all solutions as *one* PDF document. Programming code has to be submitted as Python code to the OLAT repository. Upload *all* `.py` files of your program! Use `UTF-8` as the file encoding. *Other encodings will not be taken into account!*
- Check that your code compiles without errors.
- Make sure your code is formatted to be easy to read.
  - Make sure you code has consistent indentation.
  - Make sure you comment and document your code adequately in English.
  - Choose consistent and intuitive names for your identifiers.
- Do *not* use any accents, spaces or special characters in your filenames.

Acknowledgment

This pdfLaTeX template was adapted by Jun Sun and Iryna Dubrovska based on the LuaLaTeX version by Lukas Schmelzeisen.

LaTeX

Use `pdflatex assignment_X.tex` to build your PDF.