Knowledge Engineering and Semantic Web

Exercise Sheet: 3

Will be discussed on: May 16,2023

Leibniz Universität Hannover

TUTORS:
Yaser Jaradeh, Hassan Hussien, and some other ORKG members

QUESTIONS: Please don't hesitate to ask any questions. Questions help you and your peers.
PRINT: Please consider the environment before printing the exercise.

1 Text to Turtle (including RDFS semantics)

Required rdfs properties. `rdfs:subClassOf`, `rdfs:domain`, `rdfs:range`, `rdfs:subPropertyOf`

Text:
The person Lucky Luke has a friend Jolly Jumper who is a horse.
However, Lucky Luke has also an enemy, Joe Dalton who is a person.
Rantanplan is a Dog and he knows Lucky Luke but he is a friend of Jolly Jumper.
Classes:

- ex:Person
- ex:Horse
- ex:Dog
- ex:Animal
- ex:LivingCreature.

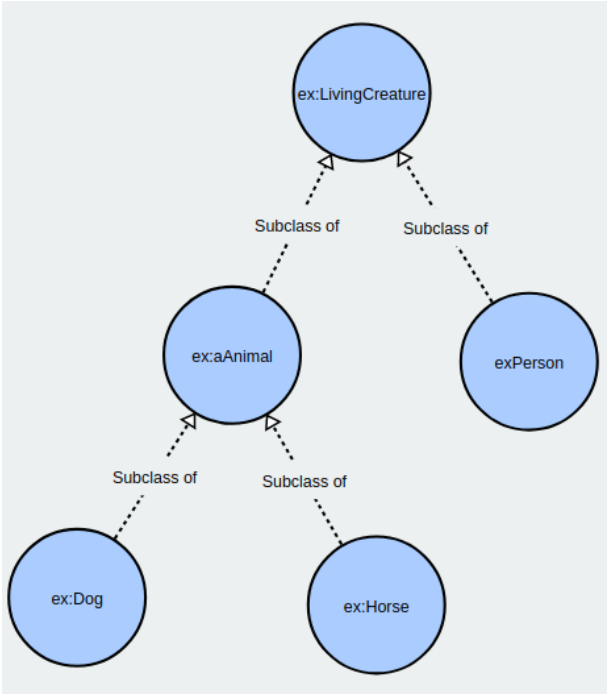
Properties:

- ex:isFriendOf
- ex:isEnemyOf
- ex:knows

1a) Create class hierarchy using the subclass relation and draw a diagram

Solution: a) Hierarchy :

```
ex:Person rdfs:subClassOf ex:LivingCreature.
ex:Animal rdfs:subClassOf ex:LivingCreature.
ex:Dog rdfs:subClassOf ex:Animal .
ex:Horse rdfs:subClassOf ex:Animal .
```



1b) Create property hierarchy and define domain range restrictions

Solution:

```
ex:isFriendOf rdfs:subPropertyOf ex:knows.
ex:isEnemyFriendOf rdfs:subPropertyOf ex:knows.
```

1c) Translate text snippet into Turtle serialization

Solution:

```
@prefix ex:   <http://example.org#>.
@prefix rdf:  <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>.
@prefix xml:  <http://www.w3.org/XML/1998/namespace>.
@prefix xsd:  <http://www.w3.org/2001/XMLSchema#>.
@prefix foaf: <http://xmlns.com/foaf/0.1/#>.

ex:Person   rdfs:subClassOf   ex:LivingCreature.
ex:Animal   rdfs:subClassOf   ex:LivingCreature.

ex:Horse    rdfs:subClassOf     ex:Animal.
ex:Dog      rdfs:subClassOf     ex:Animal.

ex:isFriendOf       rdfs:subPropertyOf      ex:knows.

ex:isEnemyOf  rdfs:subPropertyOf      ex:knows.

ex:knows    rdfs:domain     ex:LivingCreature;
            rdfs:range      ex:LivingCreature .

ex:LuckyLuke    a ex:Person;
                ex:hasName          "Lucky Luke".
```

```
ex:JollyJumper  a                  ex:Horse;
                ex:isFriendOf      ex:LuckyLuke.

ex:Rantanplan   a                ex:Dog;
                ex:knows         ex:LuckyLuke;
                ex:isFriendOf    ex:JollyJumper .

ex:JoeDalton    a              ex:Person;
                ex:isEnemyOf   ex:LuckyLuke;
```