Knowledge Engineering and Semantic Web

Exercise Sheet: 2

Will be discussed on: May 11,2021

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LECTURE SLIDES: The lecture slides can be accessed through the following link:

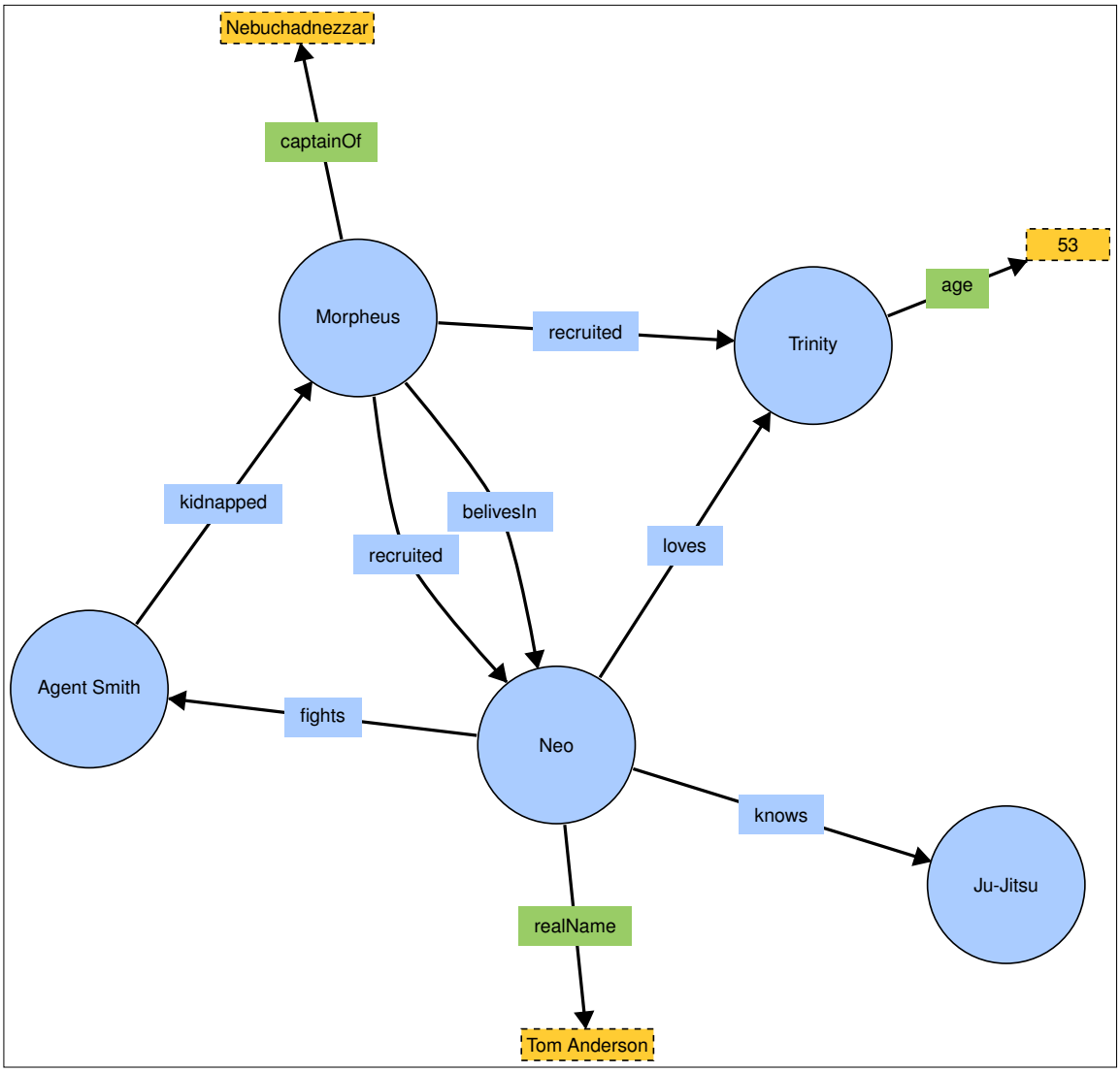
https://slidewiki.org/playlist/237

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 Previously on KESW exercise

Assume a familiar subject, such as your family or LUH

1. You have this knowledge graph



2. (optional) Write the triples of your knowledge graph in turtle representation.

2 Review questions

1. Identify the correct representation in Turtle RDF serialization of the date **12th of May 2020**

   (a) `"2020-05-12"^xsd:date`

(b) `"May-12-2020"^^xsd:date`

(c) `"2020-05-12"^^xsd:date`

(d) `"12-05-2020"xsd:date`

(e) `"12-05-2020"^^xsd:date`

For the following tasks assume the provided prefix definitions:

```
@prefix rdf:  <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.
@prefix foaf: <http://xmlns.com/foaf/0.1/#>.
@prefix dbp:  <http://dbpedia.org/property/#>.
@prefix dbr:  <http://dbpedia.org/resource/#>.
@prefix dbo:  <http://dbpedia.org/ontology/#>.
@prefix ex:   <http://example.org/#>.
```

2. According to the following Turtle triples, which abbreviation is correct?

```
dbr:Aachen     dbp:locatedIn   dbr:Germany.
dbr:Aachen     dbp:locatedIn   dbr:North_Rhine-Westphalia.
dbr:Aachen     rdf:type        dbo:City.
dbr:Bonn       dbp:locatedIn   dbr:Germany.
dbr:Bonn       dbp:locatedIn   dbr:North_Rhine-Westphalia.
dbr:Bonn       rdf:type        dbo:City.
dbr:Uni_Bonn   dbo:City        dbr:Bonn.
```

(a)
```
dbr:Aachen, dbr:Bonn   dbp:locatedIn  dbr:Germany,
                                      dbr:North_Rhine-Westphalia.
```

(b)
```
dbr:Aachen  dbp:locatedIn  dbr:Germany;
                           dbr:North_Rhine-Westphalia.
```

(c)
```
dbr:Aachen dbp:locatedIn dbr:Germany,
                         dbr:North_Rhine-Westphalia;
           a             dbo:City.
```

(d)
```
dbr:Uni_Bonn dbo:City dbr:Bonn [rdf:type dbo:City].
```

3. Identify the syntactically correct Turtle serialization.

   (a) `dbr:Karl_Marx dbo:deathDate "1883-01-01"xsd:date.`

   (b) `dbr:Karl_Marx foaf:surname Marx@en.`

   (c) `dbr:The_Communist_Manifesto dbp:releasedDate "Late February 1844".`

   (d) `"dbr:Karl_Marx" foaf:gender "male"@en.`

4. Which statement is correct about RDF lists?

   (a) The difference between containers and collection is in the ordering of elements in them.

   (b) In collection list, each item is addressed by one blank node.

   (c) In sequence container, each element is followed by rdf:first.

   (d) The rdf:Bag is used to show the ordered list of resources in the RDF.

   (e) The last element of containers followed by the predicate rdf:nil.

3 Task

Consider the following sentences:

> The Dalton Brothers band consists of four persons, Joe, William, Jack, and Averell.
> The uncle of the Dalton Brother is Marcel Dalton, who is a person and he lives in Switzerland.
> Marcel Dalton has bank, thus his job is bank owner.

1. Draw the corresponding RDF graph.
   (you can use blank nodes and one type of containers in your model)
   Hint: Draw resources as ellipses or circles and literals with rectangles.

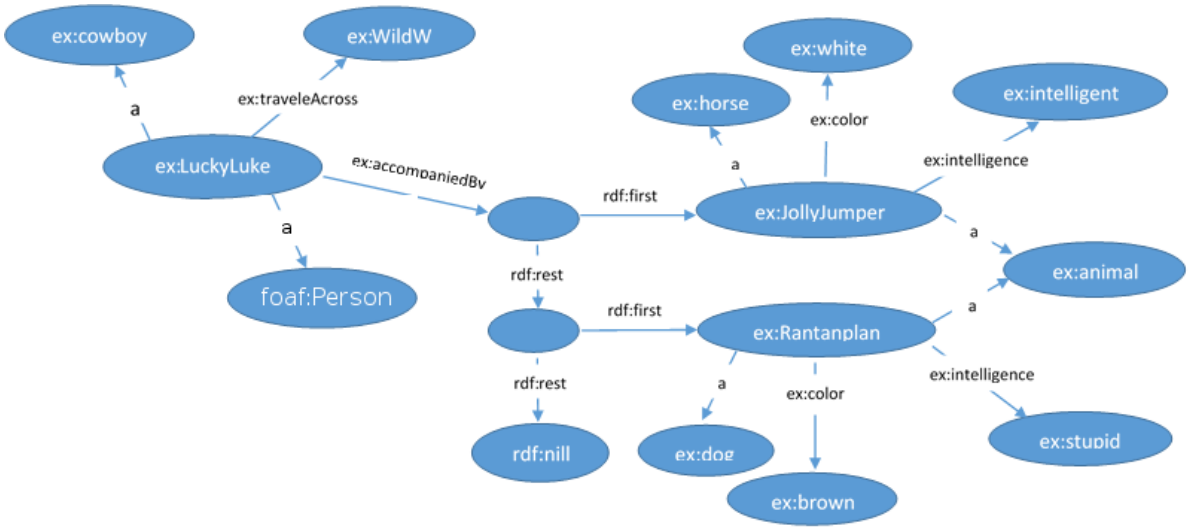
2. Represent this graph in RDF Turtle serialization.

4 Find the errors of the following RDF snippet which is represented in turtle serialization.

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.
@prefix ex:  <http://example.org#>,
@prefix dbp: <http://dbpedia.org/property/>;
@prefix dbr: <http://dbpedia.org/resource/>
dbr:Christopher_Hitchens dbp:influences  dbr:Albert_Camus.
@prefix foaf: <http://xmlns.com/foaf/0.1/>.
"The_stranger" foaf:primaryTopic <http://live.dbpedia.org/resource/The_Stranger_(novel)>,
                                 ex:author [ ex:fullname "Albert Camus";
                                             ex:nationality ex:French
                                           ];
               ex:format   [a rdf:Alt,
                            rdf:_1  ex:Book,
                            rdf:_2  ex:eBook];
               dbo:genre  ex:novel.
```

5 The following text is represented by an RDF graph.

"Lucky Luke is a cowboy person who travels across Wild West. Jolly Jumper and Rantanplan accompany Lucky Luke in his travels. Jolly Jumper is an intelligent white animal. It's a horse. But, Rantanplan is a stupid brown animal. It is a dog."



5a) Write its corresponding Turtle serialization.

5b) Create a JSON-LD representation of Turtle serialization.

6 Serializations

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

  <rdf:Description rdf:about="http://example.org/NinjaTurtles">
    <rdf:type rdf:resource="http://example.org/Comic"/>
    <ex:members>
      <rdf:Bag>
        <rdf:li>
          <rdf:Description rdf:about="http://example.org/Leo">
            <rdf:type rdf:resource="http://example.org/NinjaTurtle"/>
            <rdfs:label>Leo</rdfs:label>
            <rdfs:label>Leonardo</rdfs:label>
            <ex:maskColor>blue</ex:maskColor>
            <ex:weapons>Sword</ex:weapons>
            <ex:characteristics>tactics</ex:characteristics>
            <ex:characteristics>leader</ex:characteristics>
          </rdf:Description>
        </rdf:li>
        <rdf:li>
          <rdf:Description rdf:about="http://example.org/Donnie">
            <rdf:type rdf:resource="http://example.org/NinjaTurtle"/>
            <rdfs:label>Donnie</rdfs:label>
            <rdfs:label>Donatello</rdfs:label>
            <ex:maskColor>purple</ex:maskColor>
            <ex:weapons>staff</ex:weapons>
            <ex:characteristics>scientist</ex:characteristics>
            <ex:characteristics>engineer</ex:characteristics>
            <ex:characteristics>technological genius</ex:characteristics>
          </rdf:Description>
        </rdf:li>
        <rdf:li>
          <rdf:Description rdf:about="http://example.org/Raph">
            <rdf:type rdf:resource="http://example.org/NinjaTurtle"/>
            <rdfs:label>Raph</rdfs:label>
            <rdfs:label>Raphael</rdfs:label>
            <ex:maskColor>red</ex:maskColor>
            <ex:weapons>sai</ex:weapons>
            <ex:characteristics>muscle</ex:characteristics>
            <ex:characteristics>short fused</ex:characteristics>
          </rdf:Description>
        </rdf:li>
        <rdf:li>
          <rdf:Description rdf:about="http://example.org/Mikey">
            <rdf:type rdf:resource="http://example.org/NinjaTurtle"/>
            <rdfs:label>Mikey</rdfs:label>
            <rdfs:label>Michelangelo</rdfs:label>
            <ex:maskColor>orange</ex:maskColor>
            <ex:weapons>nunchaks</ex:weapons>
            <ex:characteristics>comedian</ex:characteristics>
            <ex:characteristics>goofy</ex:characteristics>
            <ex:characteristics>eats most of the pizza</ex:characteristics>
          </rdf:Description>
        </rdf:li>
      </rdf:Bag>
    </ex:members>
  </rdf:Description>
</rdf:RDF>
```

Tasks:

- Draw corresponding graph for the data
- Provide turtle (TTL) representation
- Provide RDFa representation for **one** of the ninja turtles.