

TUTORS:

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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 Review questions

1. Which ones could be considered as main reasons for development of semantic data web?
 - (a) Creation of huge amounts of information and data
✗ Huge amount of information is already existing on the web.
 - (b) Standardization of data for transferring
✗ Transferring of data is already standardized using protocols.
 - (c) Machine readability of data
✓ Data in the web is always represented in documents which are not machine readable.
 - (d) Meaningfulness of data
✓ Semantic Web makes the meaning for the data by indicating relation between resources and defining schemas and ontologies to make data as much meaningful as needed in the domain.

2. Which ones could be considered as motivations for development of semantic data web in future?
 - (a) Human readability of data
✗ Documents in the Web are (typically) already human readable.
 - (b) Integration of data from heterogeneous resources
✓ One important issue for web of data and semantic web is collecting and so integrating data which is gathered from different heterogeneous sources.
 - (c) Intelligent information retrieval
✓ When you make your data set with RDF model, it is always interesting to retrieve new facts (information) from it.
 - (d) Syntactical standardization of information
✗ Syntactical standardization is necessary in the progress of semantic web, but it's not a motivation for development of semantic web.

3. Choose the correct statements with respect to web standardization:

- (a) Acronym URI, identifies the unique location of each resource.
✗ What is a location of a resource?
- (b) The identity of resource could be defined uniquely by URL.
✓ The identity of resources are defined by URI not URL. However, URLs are a subset of URIs.
- (c) Acronym RDF stands for Resource Description Framework, which is standardized by W3C
✓ RDF (Resource Description Framework) is standardized by W3C.
- (d) Data is accessible only by protocol HTTPS in web of data.
✗ What about FTP?
- (e) URI is more general than IRI.
✗ IRI=Internationalized Resource Identifier is more general than URI.

4. What is correct about RDF representation of information?

- (a) Facts are represented by triples **✓ Subject-Predicate-Object**
- (b) Blank nodes can be used just as objects. **✗ No, also as Subject**
- (c) Predicates could be literal or URI **✗ Literals can only be Object**
- (d) Literals can stands in the position of subject. **✗ Literals can only be Object**
- (e) The RDFa makes it possible have meaningful RDF triples.
✗ There is no meaningful or not meaningful RDF triplet, RDFa is a serialization. For meaningfulness of triples we need schema and ontology.

2 Consider the following XML snippet

```
<person>
  <name>Averell Dalton</name>
  <robbed> Commerce Bank </robbed>
  <arrestedBy>
    <person>
      <name>Lucky Luke </name>
    </person>
  </arrestedBy>
</person>

<bank>
  <name> Commerce Bank </name>
  <location>
    <city >
      <name>Bonn</name>
    </city>
  </location>
</bank>
```

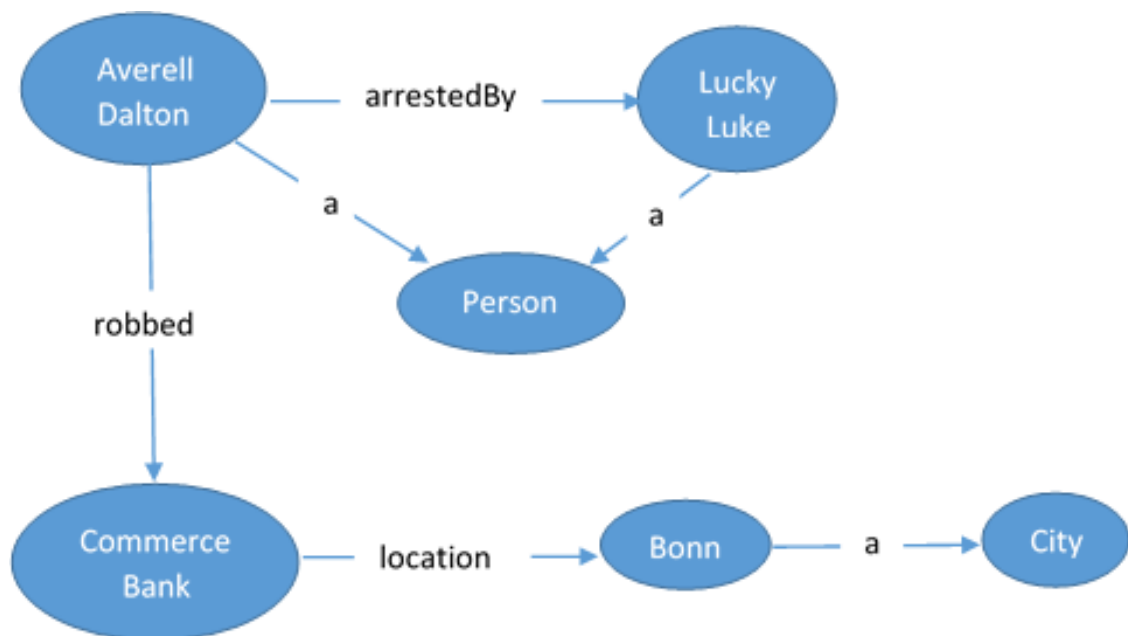
1. Try to explain it in your own words.

Solution: A Person with the name Averell Dalton has robbed the Commerce Bank. He was arrested by a person, who's name is Lucky Luke. The Bank with the name "Commerce Bank" has a location, and this location is a City with the name "Bonn".

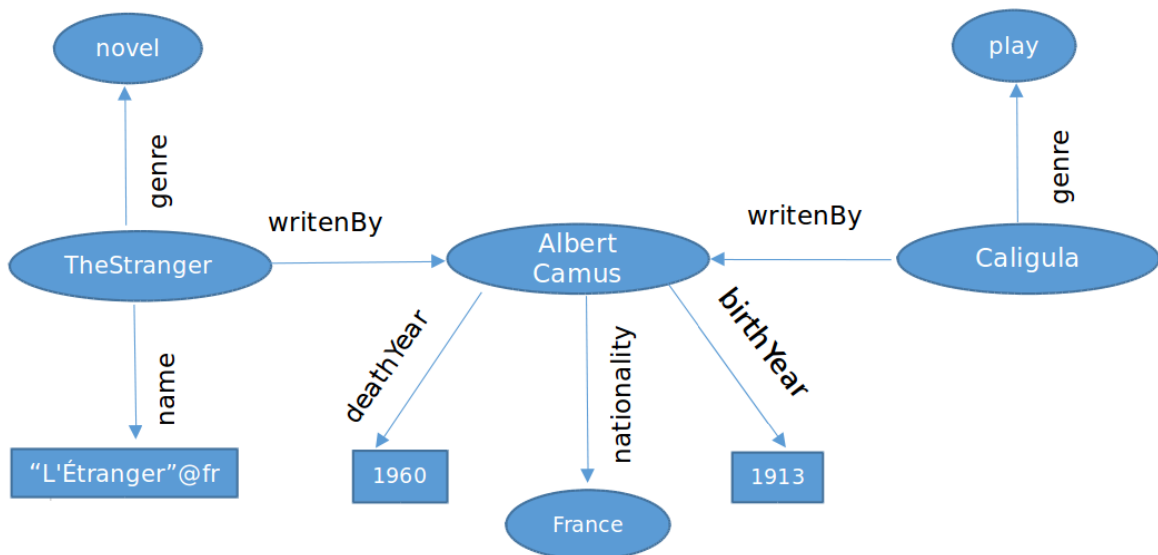
2. Transform the XML description into a graph (nodes and links). Use circles or ovals for resource nodes. Use rectangle for literals or datatype values.

Solution:

This XML snippet is amended a little to make it in an uniform definition.



3 Consider the following knowledge graph



1. Count the number of triples and indicate the URIs and literals.
2. Write each triple as a simple fact in one sentence of natural language.
3. (optional) Rewrite the extracted facts in the last section in XML representation.
4. (optional) Consider that we don't have the URI of book "The Stranger", how can we show the respective information?

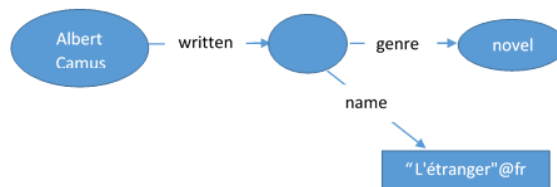
Solution:

1. 8 triples
2. (a) The Stranger is written by Albert Camus.
 (b) The genre of The Stranger is novel.
 (c) The name of The Stranger in French is "L'étranger".

- (d) Albert Camus died in 1960.
- (e) Albert Camus born in 1913.
- (f) Albert Camus in a French.
- (g) Caligula is written by Albert Camus.
- (h) The genre of Caligula is play.

```
3. <person deathYear="1960" birthYear="1913">
  <name> Albert Camus </name>
  <nationality> France </nationality>
  <written>
    <novel name="L'etranger"@fr> The Stranger </novel>
  </written>
  <written>
    <play> Caligula </play>
  </written>
</person>
```

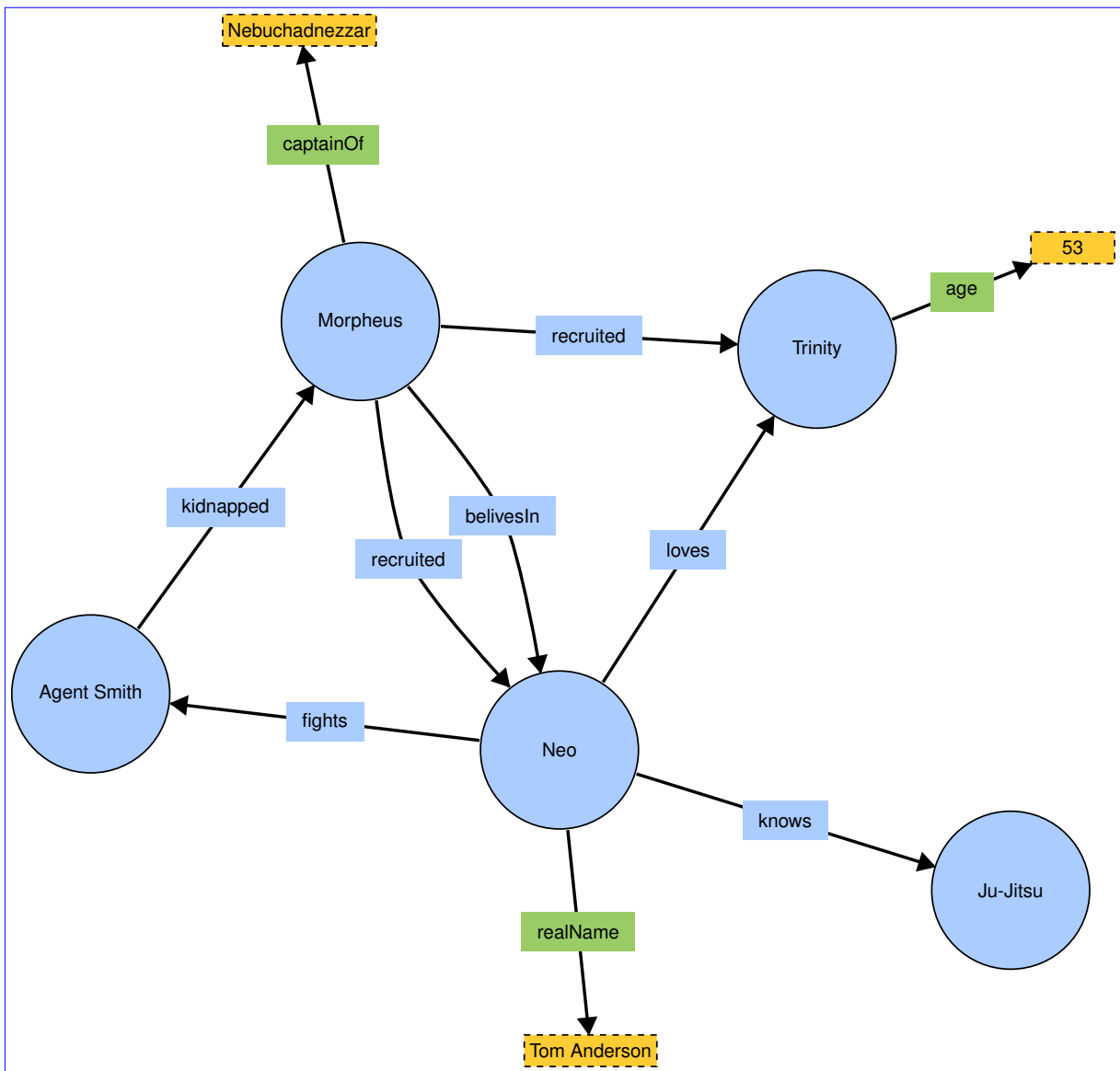
4. With blank node:



4 Assume a familiar subject, such as your family or LUH

1. Create a knowledge graph with at least 10 triples about it.
2. (optional) Write the triples of your knowledge graph in turtle representation.

Solution:



@prefix ex:<http://example.org#>.

```

ex:Neo          ex:realName    "Tom Anderson";
                ex:knows      ex:Ju-Jitsu;
                ex:loves      ex:Trinity;
                ex:fights     ex:AgentSmith.

ex:AgentSmith  ex:kidnapped   ex:Morpheus.

ex:Morpheus    ex:captainOf   "Nebuchadnezzar";
                ex:recruited  ex:Trinity;
                ex:believesIn ex:Neo;
                ex:recruited  ex:Neo, ex:Trinity.

ex:Trinity     ex:Age       "53".
  
```