E02 The Linked Data Principles

1. Quiz

Decide whether the following statements are true or false.

Q1.1 All data published as Linked Data should be in RDF.

TRUE: According to LD principle 3, the standard data model of LD is RDF.

Q1.2 In Turtle syntax, "a" is short for "One"^^<http://www.w3.org/2001/XMLSchema#integer>.

FALSE: "a" is short for http://www.w3.org/1999/02/22-rdf-syntax-ns#type

Q1.3 Blank nodes are allowed on object position of an RDF triple.

TRUE: Blank nodes are allowed on object and subject position.

Q1.4 Literals are allowed on subject position of an RDF triple.

FALSE: : Literals are only allowed on object position, subjects must be URIs or blank nodes.

Q1.5 In Turtle syntax, » <#foo> <#bar> false . « is short for , » <#foo> <#bar> "false"^^<http://www.w3.org/2001/XMLSchema#boolean> . «

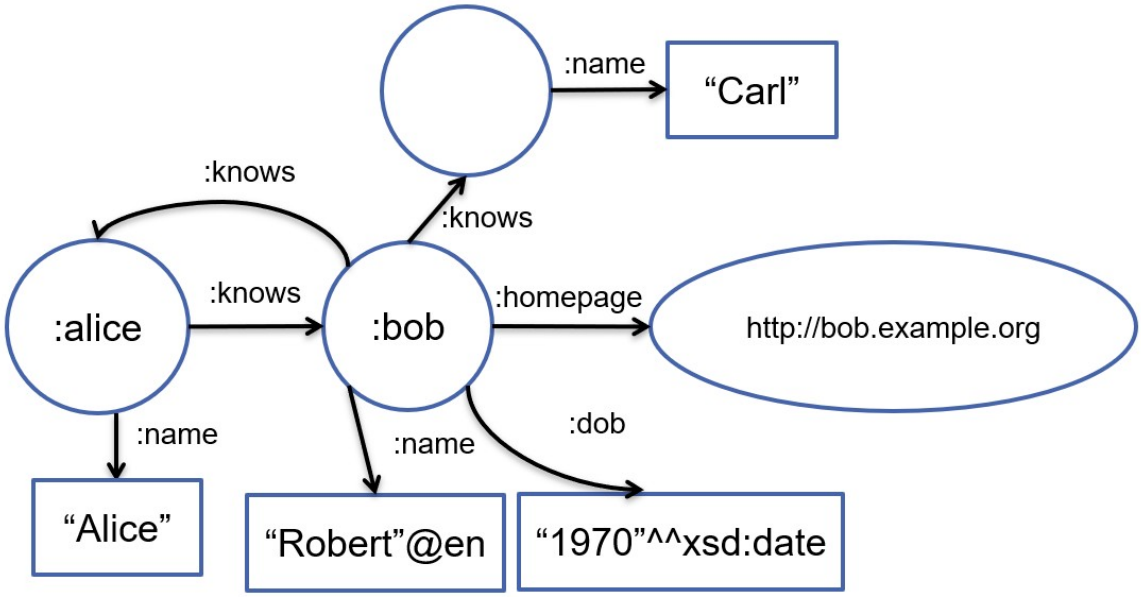
TRUE: Boolean values may be written as either 'true' or 'false' (case-sensitive) and represent RDF literals with the datatype xsd:boolean.

2. Exercises

E2.1 Draw a graphical representation of the following RDF document:

```
@prefix : <http://example.org/bar#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

:alice  :knows     :bob .
:alice  :name      “Alice” .
:bob    :knows     :alice .
:bob    :knows     _:c .
:bob    :name      “Robert”@en .
:bob    :dob       “1970”^^xsd:date.
:bob    :homepage  <http://bob.example.org>.
_:c     :name      “Carl” .
```



E2.2 Provide an abbreviated version of the set of triples from Question E2.1 using the Turtle notation. Use as many abbreviations as possible.

```
@prefix : <http://example.org/bar#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

:alice  :knows     :bob ;
   :name      “Alice” .

:bob    :knows     :alice ,
          [:name “Carl”];
   :name      “Robert”@en ;
   :dob       “1970”^^xsd:date ;
   :homepage  <http://bob.example.org>.
```

E2.3 Provide the simple triples to the following Turtle document:

```
@prefix : <http://example.org/bar#> .
[ :name “Alice” ; :knows [
    :name “Bob” ;
    :knows [
       :name “Clara” ];
     :mbox <mailto:bob@example.org> ] ].
```

```
_:alice <http://example.org/bar#name>    “Alice”.
_:alice <http://example.org/bar#knows>   _:bob.
_:bob <http://example.org/bar#name>      “Bob”.
_:bob <http://example.org/bar#knows>     _:clara.
_:clara <http://example.org/bar#name>    “Clara”.
_:bob <http://example.org/bar#mbox>
<mailto:bob@example.org> .
```

E2.4 Decide whether the following RDF documents adhere to the Linked Data principles and explain why and why not. The content of the documents is described in the following. Assume that URIs within the documents are dereferenceable.

```
Linked Data Principles:
1. Use URIs as names for things.
2. Use HTTP URIs so that people can look up those names.
3. When someone looks up a URI, provide useful information, using the
   standards (RDF*, SPARQL).
4. Include links to other URIs, so that they can discover more
   things.
```

- Document available at **ftp://example.org/france.ttl**

```
@prefix exr: <ftp://example.org/france.ttl#> .

exr:Eiffel_Tower exr:location    exr:Paris, exr:France ;
     exr:buildingEndDate   "15 March 1889" .
```

Solution	
Principle 1	**Yes**, the document uses URIs for things.
Principle 2	**No**, the URIs exr:Paris and exr:France are not HTTP URIs.
Principle 3	**Yes**, there is useful information for all URIs defined in the document, but the notion of look-up can be debated
Principle 4	**No**, there are no links to other URIs (external documents/graphs).

- Document available at **http://example.org/germany1.ttl**

```
@prefix : <#> .
:Berlin    :areaTotal      "891850000.00” ;
           :leaderTitle    :Governing_Mayor_of_Berlin .
:Karlsruhe :name           "Karlsruhe"@de ;
           :country        :Germany ;
           :federalState   :Baden-Wuerttemberg .
```

Solution	
Principle 1	**Yes**, the document uses URIs for things.
Principle 2	**Yes,** all the URIs in the document correspond to HTTP URIs.

Principle 3	**Yes**, there is useful information for all URIs defined in the document.
Principle 4	**No**, there are no links to other URIs (external documents/graphs).

- Document available at **http://example.org/germany2.ttl**

```
@prefix : <#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix geodata: <http://www.geonames.org/> .

:Germany    :name "Germany"@en, "Deutschland"@de, "Alemania"@es ;
            :capital :Berlin .

:Berlin    :areaTotal      "891850000.00” ;
           owl:sameAs      geodata:Berlin .

:Karlsruhe  :name           "Karlsruhe"@de ;
            :country        :Germany ;
            owl:sameAs      geodata:Karlsruhe .
```

Solution	
Principle 1	**Yes**, the document uses URIs for things.
Principle 2	**Yes,** all the URIs in the document correspond to HTTP URIs.
Principle 3	**Yes**, there is useful information for all URIs defined in the document.
Principle 4	**Yes,** there are links to other URIs (external documents/graphs), i.e., geodata:Karlsruhe and geodata:Berlin.

Fill the following table indicating whether the previous documents adhere to each LD principle.

Document	**Principle 1**	**Principle 2**	**Principle 3**	**Principle 4**
ftp://example.org/france.ttl	**Yes**	**No**	**Yes**	**No**
http://example.org/ germany1.ttl	**Yes**	**Yes**	**Yes**	**No**
http://example.org/ germany2.ttl	**Yes**	**Yes**	**Yes**	**Yes**

5. Practices

P3.1 Use the IDLab Turtle Validator that was developed during a summer of code hackathon to correct the syntax of the broken Turtle file below. If you are interested in joining a summer of code, there might be an option here with the EELISA group.

```
PREFIX ex: <www.example.de/>
@prefix dum: <www.dummy.de/> .

ex:bob  ex:knows   _:alice ,
                   [ du:name jim]

:alice dum:age "20" .
```

P3.2 Retrieve the resource behind DBpedia's URI for Nuremberg with cURL https://dbpedia.org/resource/Nuremberg.

```
curl.exe https://dbpedia.org/resource/Nuremberg
```

P3.3 Check out the response header of Nuremberg's information resource to find the link to download the data in Turtle format. It is best to use a text editor instead of the terminal. For that. We save the header as header.txt.

```
curl.exe -o header.txt --head https://dbpedia.org/page/Nuremberg
```

P3.4 Retrieve the RDF data of Nuremberg from DBpedia and save it as nuremberg.ttl.

```
curl.exe -o nuremberg.ttl  https://dbpedia.org/data/Nuremberg.ttl
```

P3.5 We can use triplr to convert the Turtle data to ntriples. Open a Web browser and insert the following URL.

https://triplr.org/ntriples/dbpedia.org/data/Nuremberg.ttl

P3.6 Install Mozilla Firefox and add the RDF Browser extension. Now go to https://dbpedia.org/data/Nuremberg.ttl with the extension activated. URIs are now clickable.