

Knowledge Graphs

Exercise 2: RDF

You can use one of these web services for validating/visualizing your solutions:

<https://www.ldf.fi/service/rdf-grapher> (includes visualization)

<https://rdf-play.rubensworks.net/#tab=tab-convert> (can convert to several formats)

<https://www.easyrdf.org/converter>

In case you are already familiar with jupyter notebooks, you can also use the Jupyter-RDFify [1] extension. An example notebook with installation and usage instructions is available in Ilias.

[1] <https://github.com/SemWebNotebooks/Jupyter-RDFify>

2.1 Check and correct the syntax of the following RDF (turtle) document.

```
@prefix : <http://example.org/ex1#> .

:Alice :name "Alice"@en^^xsd:string .
:Alice :studies :IE650 ; :IE500.
:Alice "livesIn" :Mannheim.
:Alice :age "25"@xsd:integer
:Alice :studies .
"Bob" :knows :Alice.
```

2.2. What do you think about this syntactically correct RDF document?

```
@prefix : <http://example.org/ex1#> .

:Alice :name "Alice" .
:Alice :age "23" .
:Alice :university "University of Mannheim" .
:Alice :studies "Knowledge Graphs" .
:Alice :knows "Bob".
```

2.3. Modeling in RDF

Model the following statements as RDF.

- Brass is an alloy made from copper and zinc.
- SPIEGEL is a German news magazine, whose headquarter is in Hamburg.
- An essay is comprised of an introduction, a main part, and a conclusion.
- Markus knows that Jutta lives in Darmstadt.
- Jutta says that her friend lives in Mannheim.
- Stefan thinks that Anna knows that he knows her father.

2.4. Interpreting RDF

You are given the following RDF document telling you which students visit which courses.

```
:Peter :visits :KnowledgeGraphs .  
:Mary :visits :KnowledgeGraphs .  
:Peter :visits :DistributedSystems .  
_:x :visits :KnowledgeGraphs .  
_:x :visits :DataMining .  
:Peter :visits _:y .  
:Mary :visits _:y .
```

How do you interpret this document? Think of questions like:

- Who is visiting which lecture?
- How many people visit a certain lecture?
- How many lectures are there?

Try to come up with a natural language paraphrase of the RDF document which is as precise as possible.

2.5. RDFa and Microdata

Create a small web page about a book, a movie or the like of your choice. Add RDFa annotations and validate the result in a web browser (for humans) and in one of the tools:

- RDFa extractor: <https://rdfa.info/play/>
- Microdata+RDFa: <https://validator.schema.org/>
- Google: <https://developers.google.com/structured-data/testing-tool/>

Now try the same with Microdata.

2.6. FOAF

FOAF (an acronym for Friend of a Friend) is a semantic vocabulary for describing persons, their activities and their relations to other people and objects. Look up the specification at <http://xmlns.com/foaf/spec/> and write your own FOAF file in Turtle Syntax. Validate it afterwards.

You can also use a FOAF generator like <http://www.ldodds.com/foaf/foaf-a-matic.html>