

Chapter 3

RDFS semantics: exercises

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Comp 318

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Solution

```
<http://example.org/#c> rdfs:type <http://example.org/#a>
```

Because:

```
<http://example.org/#a> <http://example.org/#b> <http://example.org/#c>  
<http://example.org/#b> rdfs:domain <http://example.org/#a>  
<http://example.org/#a> rdfs:subClassOf <http://example.org/#c>  
<http://example.org/#b> rdfs:subClassOf <http://example.org/#a>  
<http://example.org/#b> rdfs:type <http://example.org/#a>
```

Contradicts the triple

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Given the following RDFS graph:

```
<http://example.org/#a> <http://example.org/#b> <http://example.org/#c>  
<http://example.org/#b> rdfs:domain <http://example.org/#a>  
<http://example.org/#a> rdfs:subClassOf <http://example.org/#c>  
<http://example.org/#b> rdfs:subClassOf <http://example.org/#a>  
<http://example.org/#b> rdfs:type <http://example.org/#a>
```

Which of the following triples is not part of the RDFS-entailed graph:

- (a) <http://example.org/#a> <http://example.org/#b> <http://example.org/#c>
- (b) <http://example.org/#b> rdfs:type <http://example.org/#c>
- (c) <http://example.org/#c> rdfs:type <http://example.org/#a>
- (d) <http://example.org/#a> rdfs:type <http://example.org/#c>
- (e) <http://example.org/#b> rdfs:subClassOf <http://example.org/#c>
- (f) <http://example.org/#a> rdfs:type <http://example.org/#a>

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Turtle syntax

- Simple triple: subject predicate object .
:john rdf:label "John"
- I Grouping triples: subject predicate object ; predicate object... .
:john
rdf:label "John" ;
rdf:type ex:Person ;
:homePage <http://example.org/johnspage/> .

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Exercise 2a

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph **simple**-entailed by S? Explain the answer

```
rdf:type rdf:type rdf :Property
:b rdfs:domain _:y
```

Exercise 2a

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph **simple**-entailed by S? Explain the answer

```
rdf:type rdf:type rdf :Property
:b rdfs:domain _:y
```

No. Simple entailment does not include axiomatic triples and the use of rdf:type in property position does not entail the first triple.

Exercise 2b

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:b rdfs :domain _:z .
:f :b :g
```

Exercise 2b

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:b rdfs:domain _:z .
:f :b :g
```

Yes. The first triple follows from bNode renaming and the second triple is included in the original graph.

Exercise 2c

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:c rdf:type rdfs:Class .
:b rdf:type rdf:Property .
:f rdf:type _:x .
```

Exercise 2c

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:c rdf:type rdfs:Class .
:b rdf:type rdf:Property .
:f rdf:type _:x .
```

No. The first triple it is not entailed under RDF semantics. However, it would be entailed under OWL semantics (as we will see)

Exercise 2d

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:b rdfs:subClassOf :a .
:v rdf:type rdfs:Class .
:f rdf:type _:x .
:g rdf:type _:y .
```

Exercise 2d

Given the RDF graph S:

```
:b rdfs:subClassOf :a
:b rdfs:domain _:x
:c rdf:type owl:Class
:f :b :g
```

Is the following graph simple-entailed by S? Explain the answer

```
:b rdfs:subClassOf :a .
:v rdf:type rdfs:Class .
:f rdf:type _:x .
:g rdf:type _:y .
```

Yes. The first triple is included in the original graph; from the rdfs:subClassOf and the rdfs:domain statements we can infer the second triple; the third and fourth triple follow from the occurrence of :f and :g in the original graph and the fact that every resource is of rdf:type rdfs:Resource.