



University of
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RDF Schema

COMP6215 Semantic Web Technologies

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Using RDF to define RDFS

RDFS is a simple ontology language for use with RDF

RDFS is an RDF vocabulary which contains:

- Classes for defining classes and properties
- Properties for defining basic characteristics of classes and properties
 - Global property domains and ranges
- Some ancillary properties
 - Defined by, see also

Notes on RDF and RDFS namespaces

Most terms in RDF Schema are defined as part of the RDFS namespace

- <http://www.w3.org/2000/01/rdf-schema#> , abbreviated here as `rdfs:`

Two terms are defined as part of the RDF namespace: `rdf:type` and `rdf:Property`

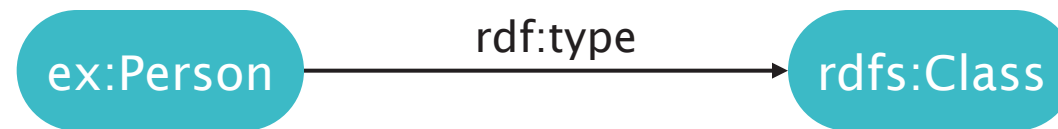
- <http://www.w3.org/1999/02/22-rdf-syntax-ns#> , abbreviated as `rdf:`

This is a historical accident, but can trip up the unwary

Be careful when using these terms in SPARQL queries!

RDF Schema class definitions

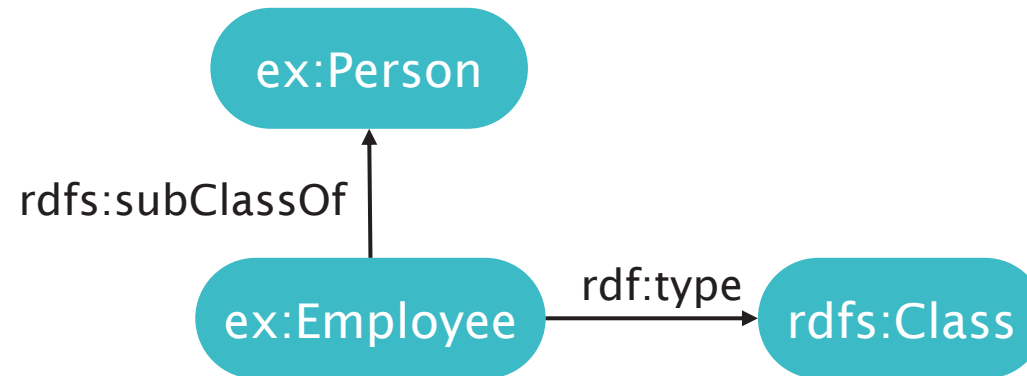
We wish to define the class Person:



```
ex:Person rdf:type rdfs:Class .
```

RDF Schema class definitions

Employee is a subclass of Person

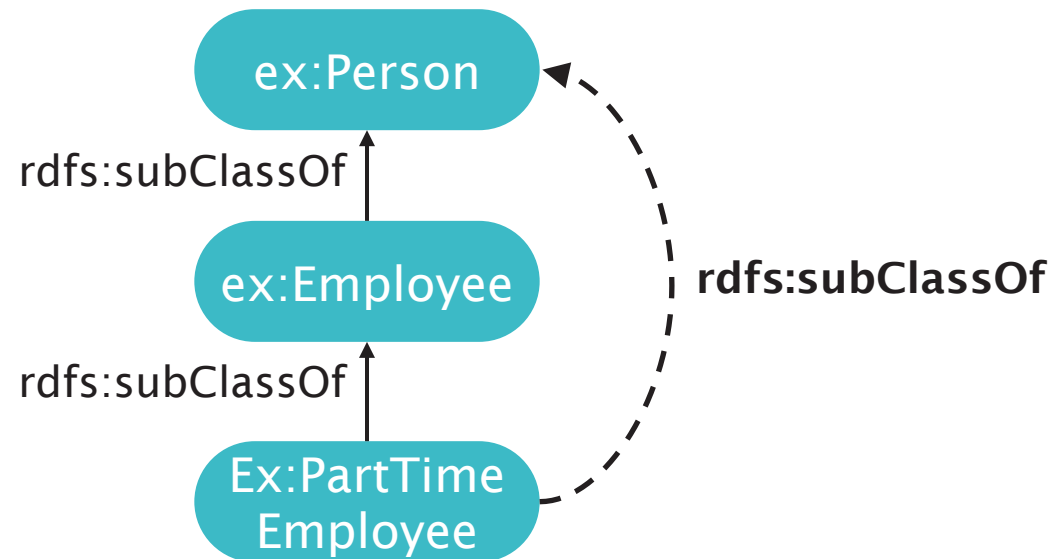


```
ex:Employee rdf:type rdfs:Class ;  
            rdfs:subClassOf ex:Person .
```

RDF Schema class semantics

rdfs:subClassOf is transitive:

(A rdfs:subClassOf B) and (B rdfs:subClassOf C) implies (A rdfs:subClassOf C)



RDF Schema class semantics

rdfs:subClassOf is reflexive

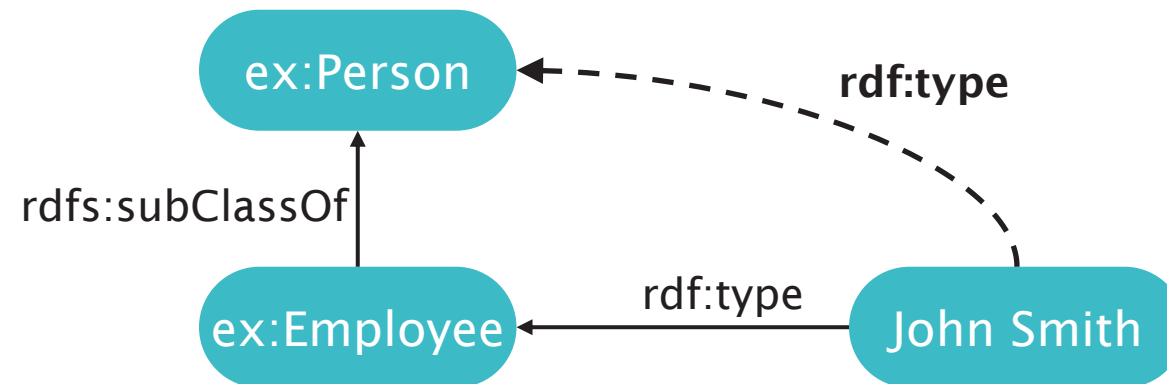
- All classes are subclasses of themselves



RDF Schema class semantics

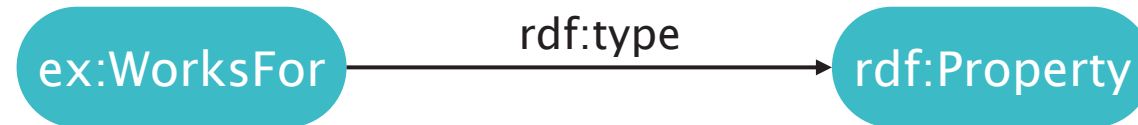
rdf:type distributes over rdfs:subClassOf:

(A rdfs:subClassOf B) and (C rdf:type A) implies (C rdf:type B)



RDF Schema property definitions

We wish to define the property worksFor:



```
ex:WorksFor rdf:type rdf:Property .
```

RDF Schema property definitions

Important difference between RDF and object-oriented programming languages

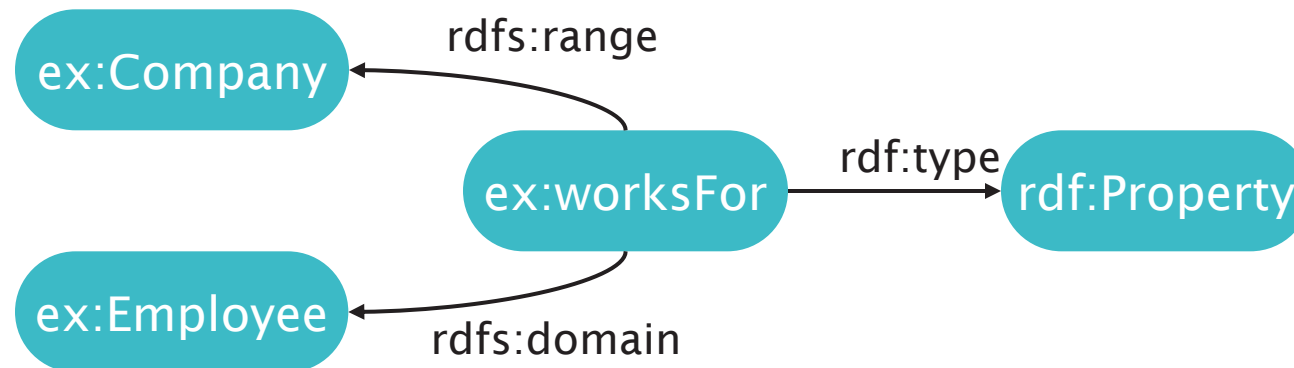
- OO languages define classes in terms of the properties they have
- RDF defines properties in terms of the classes whose instances they relate to each other

The *domain* of a property is the class that the property runs *from*

The *range* of a property is the class that a property runs *to*

RDF Schema property definitions

The property worksFor relates objects of class Employee to objects of class Company

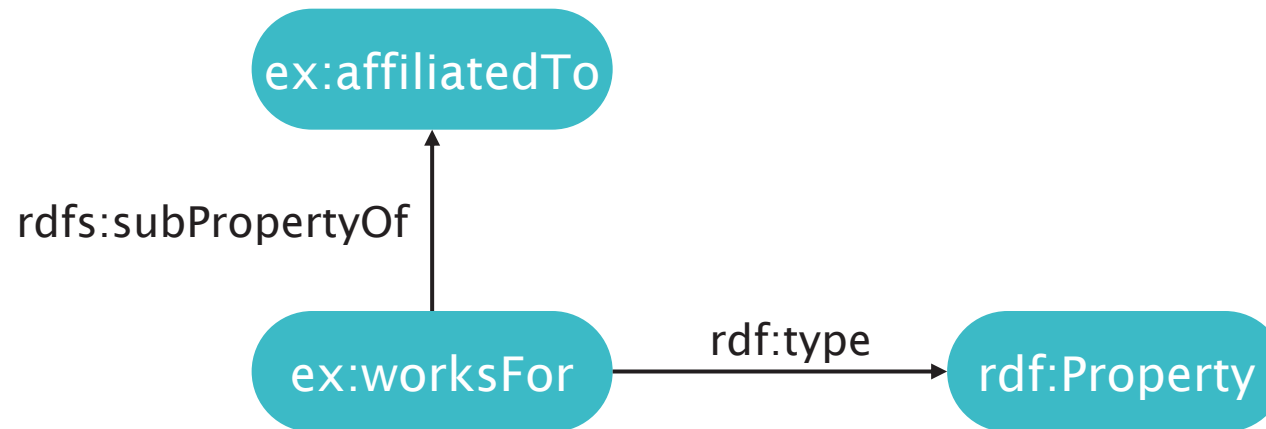


```
ex:worksFor rdf:type rdf:Property ;  
            rdfs:domain ex:Employee ;  
            rdfs:range ex:Company .
```

RDF Schema property definitions

Specialisation exists in properties as well as classes

- worksFor is a subproperty of affiliatedTo

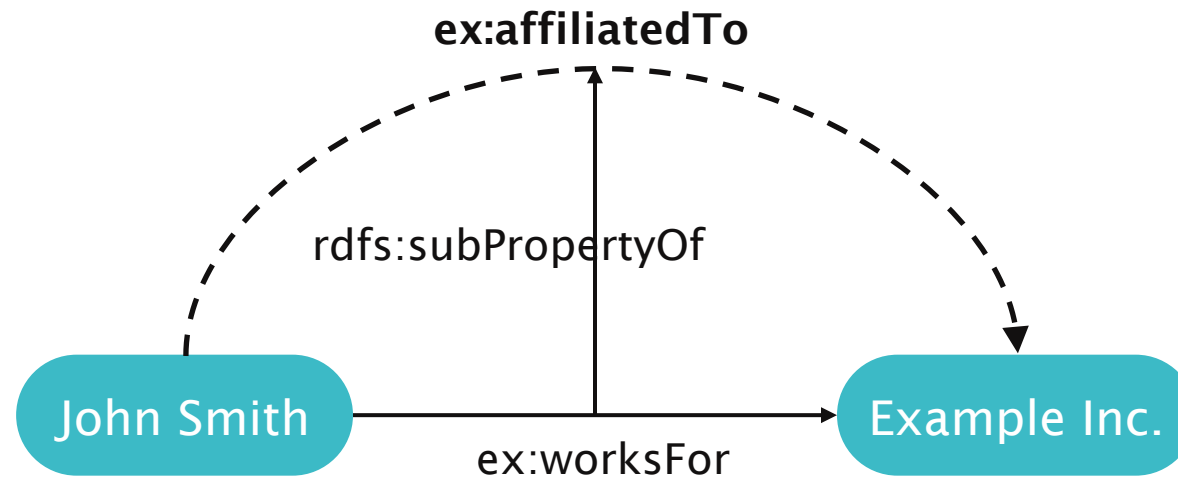


```
ex:worksFor rdf:type rdf:Property ;  
            rdfs:subPropertyOf ex:affiliatedTo
```

RDF Schema property semantics

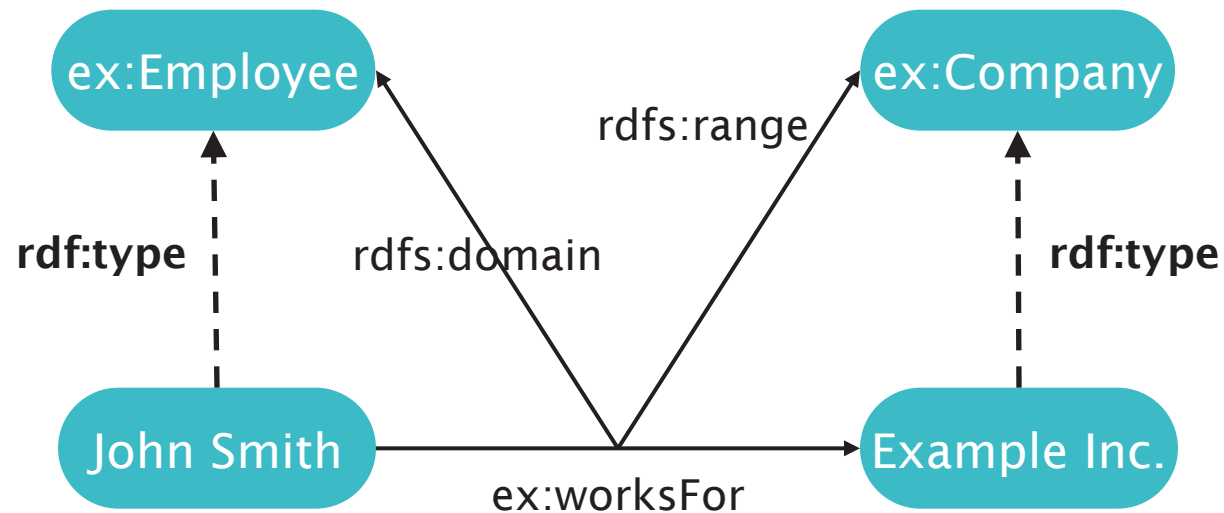
`rdfs:subPropertyOf` is transitive and reflexive

- Entailment of superproperties



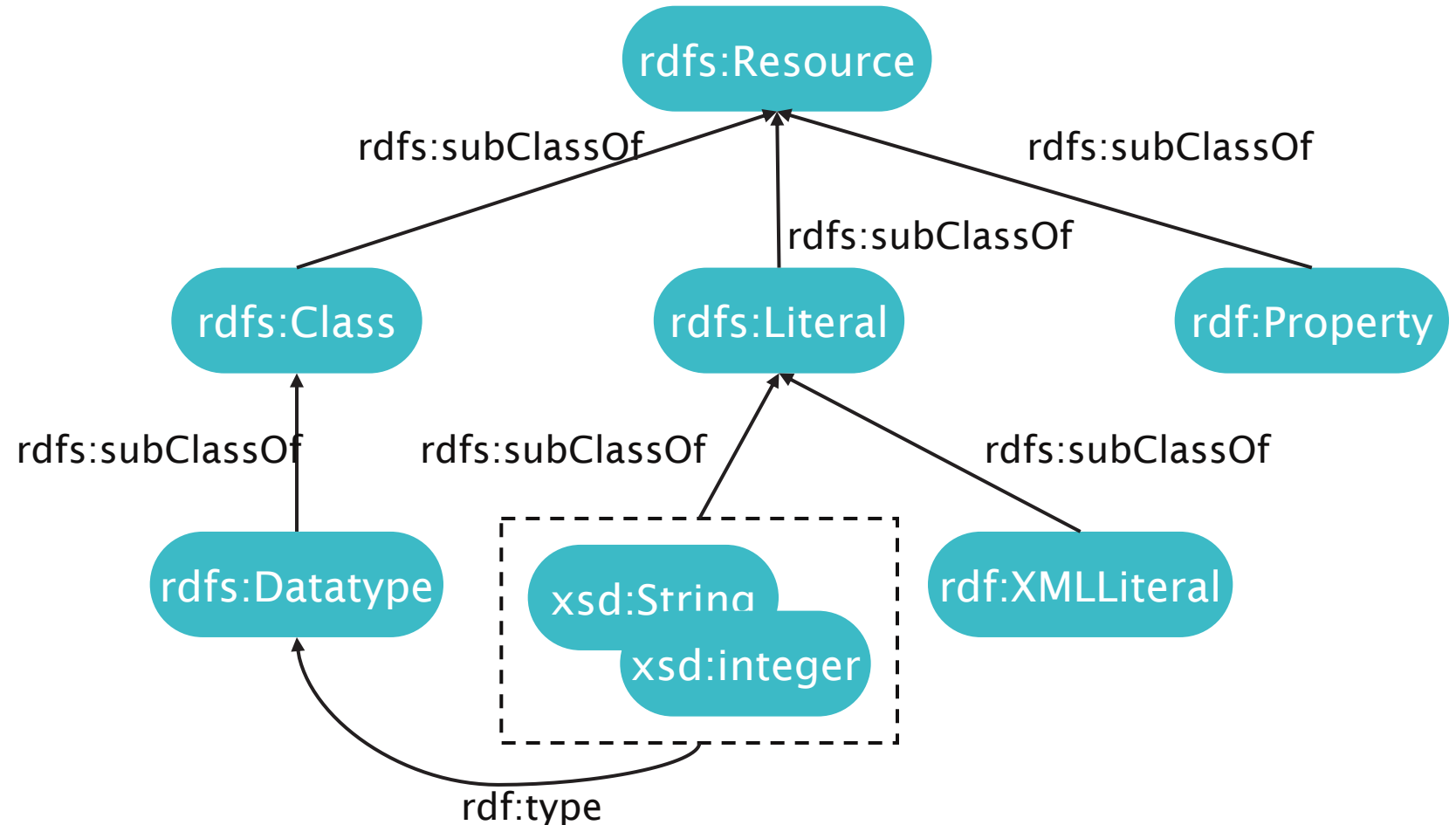
RDF Schema property semantics

Type entailments from range and domain constraints



RDF Schema predefined classes

- rdfs:Class
- rdf:Property
- rdfs:Resource
- rdfs:Literal
- rdfs:Datatype
- rdf:XMLLiteral



RDF Schema ancillary features

`rdfs:label` is used to give a human-readable name for a resource

```
<#person-01269> rdfs:label "John Smith" .
```

`rdfs:comment` is used to give a human-readable description for a resource

```
<#Employee> rdfs:comment "A person who works." .
```

`rdfs:seeAlso` is used to indicate a resource which can be retrieved to give more information about something

`rdfs:isDefinedBy` indicates a resource which is responsible for the definition of something (a subproperty of `rdfs:seeAlso`)

RDF Schema Status

- Original version contemporary with RDF (but never became a W3C Recommendation)
- Revised version published in 2004
- Second revision published in 2014

Next Lecture: Description Logics