Mayank Kejriwal

University of Southern California

Ontologies and Web Ontology Language (OWL)

name	rank
Bob	Captain
Sue	Sargent
Mary	
	Admiral
Joe	Sargent

```
select ?x      { ?x  rank  “Sargent” }

select ?x      { ?x  a  Person }

select ?x      { ?x  a  MilitaryPerson }
```

inferencing

I tell the computer some triples

it infers more triples

name	rank
Bob	Captain
Sue	Sargent
Mary	Admiral
Joe	Sargent

```
bob     a foaf:Person;
            foaf:name
“Bob”;
            ex:rank
“Captain” .
sue     a foaf:Person;
            foaf:name “Sue”;
            ex:rank “Sargent” .
```

```
select ?x     { ?x  rank  “Sargent” }

select ?x     { ?x  a  Person }

select ?x     { ?x  a  MilitaryPerson }
```

name	rank
Bob	Captain
Sue	Sargent
Mary	Admiral
Joe	Sargent

```
bob         a foaf:Person;
                  foaf:name
“Bob”;
                  ex:rank
“Captain” .
sue         a foaf:Person;
                  foaf:name “Sue”;
                  ex:rank “Sargent” .
```

```
select ?x     { ?x  a  MilitaryPerson }
```

what inference do I need?

name	rank
Bob	Captain
Sue	Sargent
Mary	Admiral
Joe	Sargent

```
bob         a foaf:Person;
                        foaf:name
“Bob”;
                        ex:rank
“Captain” .
sue         a foaf:Person;
                        foaf:name “Sue”;
                        ex:rank “Sargent” .
```

```
select ?x      { ?x  a  MilitaryPerson }
```

ONE SMALL **RDFSCHEMA** STATEMENT

```
ex:rank   rdfs:domain    ex:MilitaryPerson  .
```

RDF Schema Vocabulary

xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"

Classes

rdfs:Resource

rdfs:Class

rdfs:Literal

rdfs:Datatype

rdf:XMLLiteral

rdf:Property

Properties

rdfs:range

rdfs:domain

rdf:type

rdfs:subClassOf

rdfs:subPropertyOf

rdfs:label

rdfs:comment

Utility Properties

rdfs:seeAlso

rdfs:isDefinedBy

rdf:value

RDF Schema Vocabulary

xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"

Classes

rdfs:Resource

rdfs:Class

rdfs:Literal

rdfs:Datatype

rdf:XMLLiteral

rdf:Property

Properties

rdfs:range

rdfs:domain

rdf:type

rdfs:subClassOf

rdfs:subPropertyOf

rdfs:label

rdfs:comment

Utility Properties

rdfs:seeAlso

rdfs:isDefinedBy

rdf:value

Basic Idea

I state a few OWL axioms

I load lots of triples

the system infers lots of new triples

OWL Building Blocks

Classes

Properties

Individuals

Unique Name Assumption

```
bob     a foaf:Person;
                foaf:name “Bob”;
                ex:rank “Captain” .
```

```
sue     a foaf:Person;
                foaf:name “Sue”;
                ex:rank “Sargent” .
```

Unique Name Assumption = TRUE:

bob and sue refer to different individuals in the world

Unique Name Assumption

```
bob       a foaf:Person;
                    foaf:name
"Bob";
                    ex:rank
"Captain" .
```

```
sue       a foaf:Person;
                    foaf:name "Sue";
                    ex:rank "Sargent" .
```

Unique Name Assumption = TRUE:

bob and sue refer to different individuals in the world

Unique Name Assumption = FALSE:

bob and sue may refer to the same individual in the world

OWL

Unique Name Assumption = FALSE

Open World, Closed World

I tell the computer some triples

Open World, Closed World

I tell the computer some triples

Closed World:

Open World, Closed World

I tell the computer some triples

Closed World:
if I don’t tell it something, assume it’s false

Open World, Closed World

I tell the computer some triples

Closed World:
if I don’t tell it something, assume it’s false

Open World:

Open World, Closed World

I tell the computer some triples

Closed World:
if I don’t tell it something, assume it’s false

Open World:
if I don’t tell it something, don’t assume anything
I might tell it later that it is true