PelletSpatial

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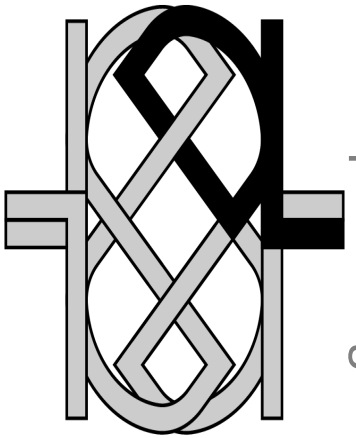
Who is this guy?

What is he doing here?



Description Logics

DL
Description Logics

Knowledge Base

TBox

Concepts
Roles

Inclusions
Equalities
Conjunction
Disjunction

Axioms

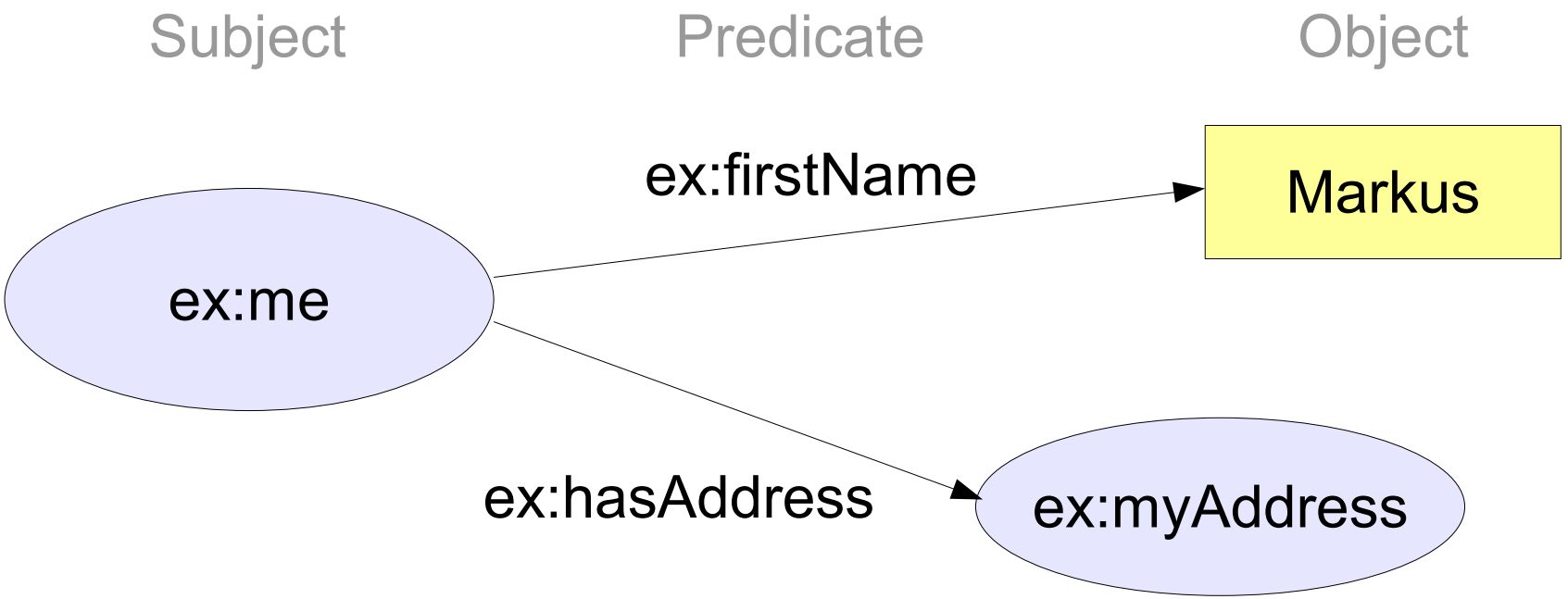
ABox

Individuals
a, b

Concept Assertions
C(a)

Role Assertions
R(a,b)

RDF
Resource Description Framework



URI PREFIX ex: <http://example.org#>

OWL (-DL)
Web Ontology Language

In short, an OWL(-DL) document is a DL KB

SPARQL
SPARQL Protocol And RDF Query Language

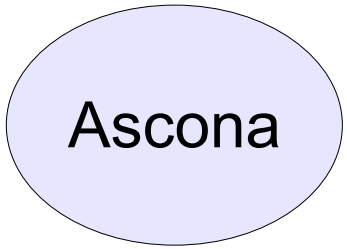
```
PREFIX ex: <http://example.org#>

SELECT ?fn
WHERE
{
    ex:me    ex:firstName   ?fn
}
```

?fn = “Markus”

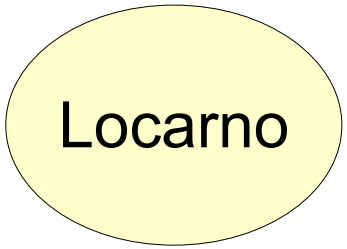
RCC
Region Connection Calculus

Spatial representation and reasoning

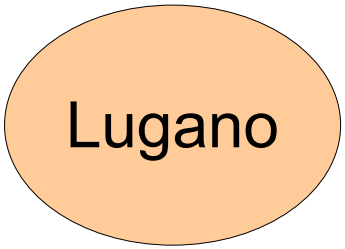
RCC
Spatial Representation



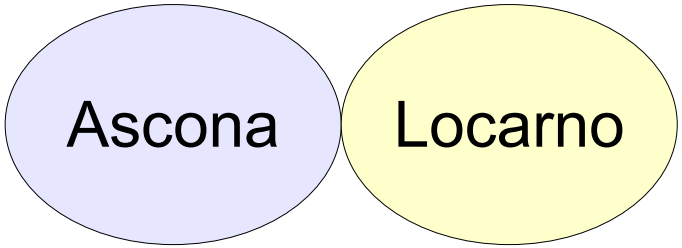
Region



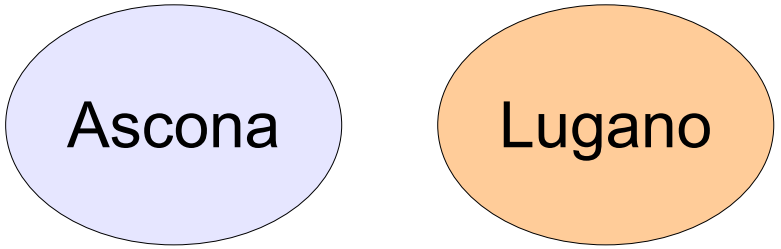
Region



Region

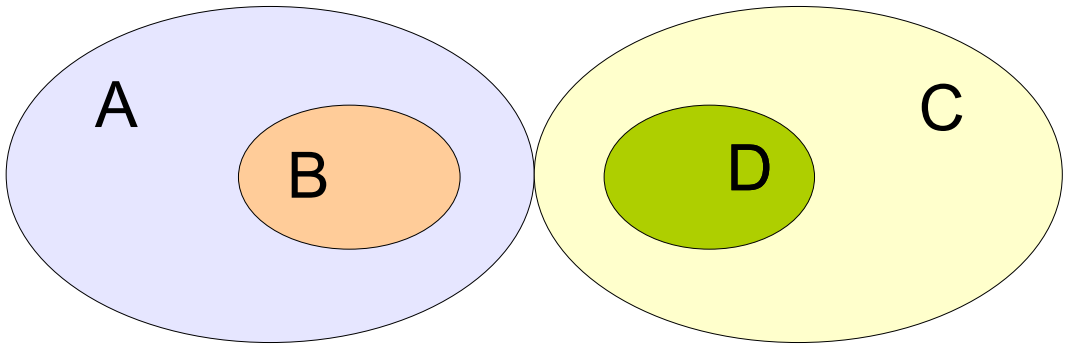


Externally Connected



Disconnected

RCC
Spatial Reasoning (Inference)

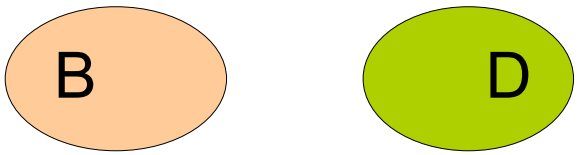


EC(A, C)

NTPP(B, A)

NTPP(D, C)

Inference



DC(B, D)

DC(D, B)

PelletSpatial

OWL Reasoner

Represent RCC KB

Support reasoning and query

RCC
Translation To Description Logics

RCC

DC(A, B)

OWL-DL

Class(A) Class(B) disjointWith(A,B)

$A \cap B = \emptyset$

PelletSpatial Example

Data

Madison NTPP DaneCounty
DaneCounty NTPP Wisconsin
Wisconsin NTPP USA

Query

?x NTPP USA

Results

?x = Madison
?x = DaneCounty
?x = Wisconsin

PelletSpatial Example (SPARQL)

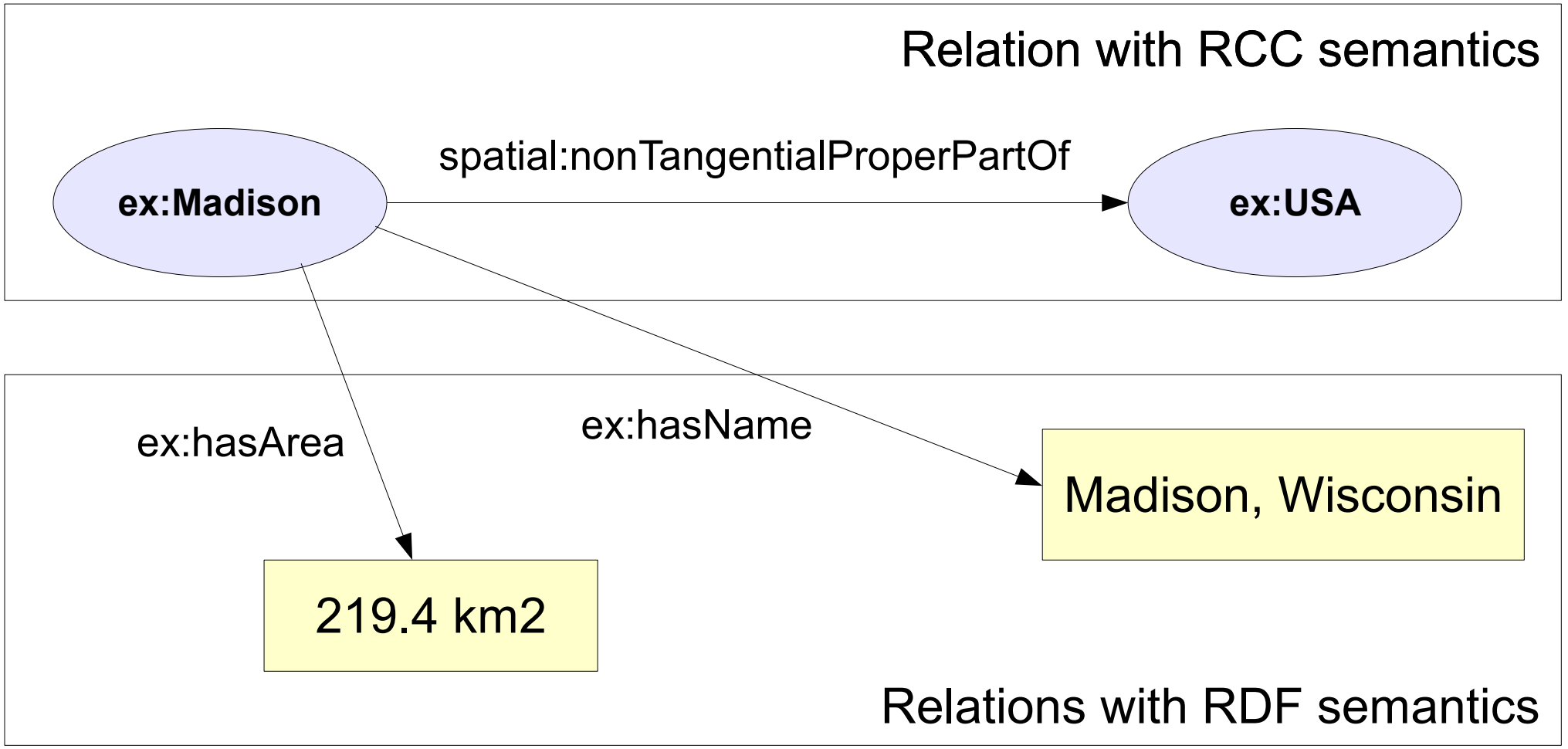
Query

```
PREFIX ex: <http://example.org#>
PREFIX spatial: <http://clarkparsia.com/pellet/spatial#>

SELECT ?x
WHERE { ?x spatial:nonTangentialProperPartOf ex:USA }
```

Results

?x = ex:Madison
?x = ex:DaneCounty
?x = ex:Wisconsin

PelletSpatial
Region RDF Metadata



PelletSpatial
RDF Metadata SPARQL

Query

```
PREFIX ex: <http://example.org#>
PREFIX spatial: <http://clarkparsia.com/pellet/spatial#>

SELECT ?x ?y
WHERE {
    ?x spatial:nonTangentialProperPartOf ex:USA .
    ?x ex:hasArea ?y
}
```

Results

?x = ex:Madison ?y = “219.4 km2”

PelletSpatial

Conclusions

Thanks for your attention!

Questions?