

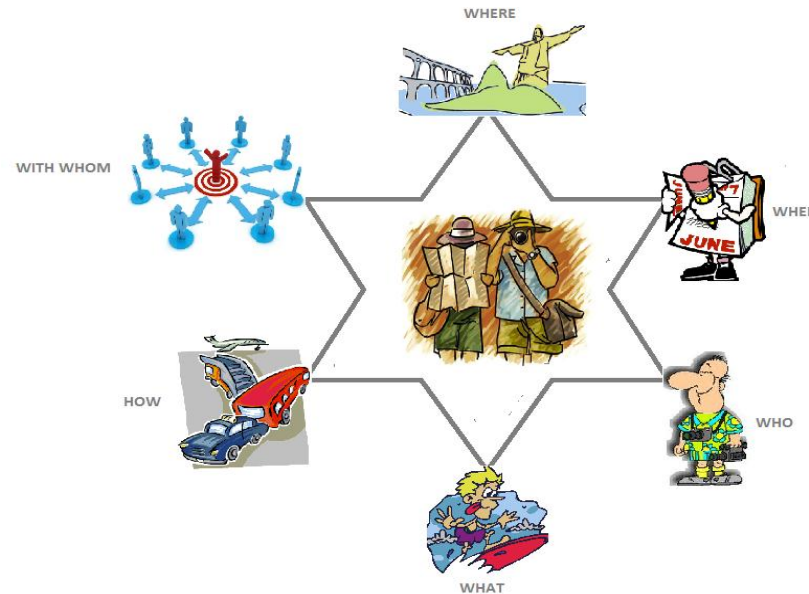
E-TOURISM RECOMENDER



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ONTOLOGY OVERVIEW

The e-tourism ontology was built to answer the main questions that can be asked when we are on holidays: Where, When, Who, What, How, With Whom:



- **Who:** User profile and preferences.
- **Where:** Where are the interesting places to see and visit located.
- **When:** When can the tourist visit a particular place. This includes the day of the week and the atmospheric and sea conditions.
- **What:** What can a tourist see, visit and do.
- **How:** Options of transport that they are available
- **With Whom:** Social component of the user, with whom he/she wants to share his/her activities.

WHO?

INDIVIDUAL EDITOR for SocialTourism:Susana (instance of SocialTourism:User, owl:NamedIndividual)

SocialTourism:User (1)

INSTANCE BROWSER
For Class: SocialTourism:User
Asserted Inferred
Asserted Instances
SocialTourism:Susana

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#Susana>

SocialTourism:User owl:NamedIndividual

hasGPS_lat 23.2

hasGPS_long 43.3

SocialTourism:hasPosition
SocialTourism:RiodeJaneiro

Give_Notice
foaf2:ana
foaf2:me

has SocialProfile
foaf2:me

SocialTourism:hasRecomendations
SocialTourism:Surf

SocialTourism:hasRole
SocialTourism:AdventureR

$$\text{SocialTourism:User}(?x) \wedge \text{hasSocialProfile}(?x, \text{foaf2:me}) \wedge \text{hasInterest}(\text{foaf2:me}, ?\text{activ}) \wedge \text{SocialTourism:hasRole}(?x, \text{SocialTourism:AdventureR}) \wedge \text{SocialTourism:hasActivities}(\text{SocialTourism:AdventureR}, ?\text{activ}) \rightarrow \text{SocialTourism:hasRecomendations}(?x, ?\text{activ})$$

$$\text{SocialTourism:User}(?x) \wedge \text{hasSocialProfile}(?x, \text{foaf2:me}) \wedge \text{hasInterest}(\text{foaf2:me}, \text{SocialTourism:ClimbMountain}) \wedge \text{foaf:Person}(?y) \wedge \text{hasInterest}(?y, \text{SocialTourism:ClimbMountain}) \rightarrow \text{Give_Notice}(?x, ?y)$$

WHERE?

- ▼ SocialTourism:Position
 - SocialTourism:City (1)
 - ▼ SocialTourism:NaturalRegion
 - SocialTourism:CityCenter (1)
 - SocialTourism:Coastal (3)
 - SocialTourism:Lake (1)
 - SocialTourism:Mountain (1)

INSTANCE BROWSER

For Class: ● SocialTourism:Coastal

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:Arpoador
- ◆ SocialTourism:Copacabana
- ◆ SocialTourism:Ipanema

http://www.ipanema.com/citytour/mapcopa.htm (instance of protege:ExternalResource)

INDIVIDUAL EDITOR for http://www.ipanema.com/citytour/mapcopa.htm (instance of protege:ExternalResource)

For individual: http://www.ipanema.com/citytour/mapcopa.htm

Name

http://www.ipanema.com/citytour/mapcopa.htm

CLICKABLE STREET MAP & WALKING TOUR

map features the main streets of Copacabana from Posto 5 to Leme. There is an additional map of Copacabana's Posto 6, Arpoador, and the East Side of Ipanema. Click on the sensitive areas to view [pictorial tours](#), with photos and insider's tips



INDIVIDUAL EDITOR for SocialTourism:Copacabana (instance of SocialTourism:Coastal, owl:NamedIndividual)

For Individual: http://www.owl-ontologies.com/SocialTourism.owl#Copacabana

SocialTourism:Coastal owl:NamedIndividual

SocialTourism:Activity_Available true

hasGPS_lat 23.1

hasGPS_long 43.2

SocialTourism:hasCity

- ◆ SocialTourism:RioDeJaneiro

SocialTourism:hasWeather

- ◆ SocialTourism:Warm_Sunny

hasOnlineInfo

- ◆ http://www.ipanema.com/citytour/mapcopa.htm

hasTransportRecommendations

- ◆ SocialTourism:Walking

SocialTourism:hasTransport

- ◆ SocialTourism:Metro
- ◆ SocialTourism:Walking

SocialTourism:OfferActivities

- ◆ SocialTourism:Surf

SocialTourism:hasSeaConditions

- ◆ SocialTourism:HighWave

Annotations

Lang

WHEN?



INSTANCE BROWSER

For Class: ● SocialTourism:SeaConditions

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:HighWave
- ◆ SocialTourism:Mediumwaves
- ◆ SocialTourism:NoWave



INDIVIDUAL EDITOR for SocialTourism:HighWave (instance of SocialTourism:SeaConditions)

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#HighWave>

SocialTourism:SeaConditions owl:NamedIndividual

SocialTourism:waveMeters

3



$User(?x) \wedge hasRole(?x, ?y) \wedge hasPosition(?y, ?z) \wedge hasNaturalEnv(?z, ?nat) \wedge OfferActivities(?nat, ?act) \wedge hasSeaConditions(?act, ?sea) \wedge swrlb:greaterThan(?sea, 1) \rightarrow Activity_Available(?act, "true")$

$User(?x) \wedge hasRole(?x, ?y) \wedge hasPosition(?y, ?z) \wedge hasNaturalEnv(?z, ?nat) \wedge OfferActivities(?nat, ?act) \wedge hasSeaConditions(?act, ?sea) \wedge swrlb:lessThan(?sea, 1) \rightarrow Activity_Available(?act, "true")$



INSTANCE BROWSER

For Class: ● SocialTourism:DateTime

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:CurrentTime
- ◆ SocialTourism:EndCarnaval
- ◆ SocialTourism:EndTour
- ◆ SocialTourism:StartCarnaval
- ◆ SocialTourism:StartTour



INDIVIDUAL EDITOR for SocialTourism:EndTour (instance of SocialTourism:DateTime)

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#EndTour>

SocialTourism:dateTime

25/06/2012



$swrlb:dateTime(CurrentTime) \wedge ends_at(?activ, ?StopTime) \wedge swrlb:greaterThan(?StopTime, CurrentTime) \wedge starts_at(?activ, ?StartTime) \wedge swrlb:greaterThan(CurrentTime, ?StartTime) \rightarrow Open(?activ, "true")$

WHAT?

- ▼ ● SocialTourism:Activities
 - ▼ ● SocialTourism:Adventure
 - SocialTourism:Climb (1)
 - SocialTourism:Fishing (1)
 - SocialTourism:Surfing (1)
 - SocialTourism:Cultural (2)



INSTANCE BROWSER

For Class: ● SocialTourism:Surfing

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:Surf



INDIVIDUAL EDITOR for SocialTourism:Surf (instance of SocialTourism:Surfing, owl:NamedIndividual)

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#Surf>

SocialTourism:Surfing owl:NamedIndividual

hasOnlineInfo

- http://farm5.static.flickr.com/4119/4805690645_abb1f2f406.jpg

SocialTourism:Activities_in

- ◆ SocialTourism:Arpoador
- ◆ SocialTourism:Copacabana
- ◆ SocialTourism:Ipanema

RESTRICTIONS

CLASS EDITOR for SocialTourism:Surfing (instance of owl:Class)

For Class: <http://www.owl-ontologies.com/SocialTourism.owl#Surfing>


- SocialTourism:Adventure
- ▼ SocialTourism:Activities_in **only** SocialTourism:Coastal

INDIVIDUAL EDITOR for http://farm5.static.flickr.com/4119/4805690645_abb1f2f406.jpg (instance of ...)

For Individual: http://farm5.static.flickr.com/4119/4805690645_abb1f2f406.jpg

Name

http://farm5.static.flickr.com/4119/4805690645_abb1f2f406.jpg



Download, Previous, Next, Refresh, Add icons at the bottom.

HOW?

- SocialTourism:Transport
 - SocialTourism:PublicTransp (1)
 - SocialTourism:Walk (1)

INSTANCE BROWSER

For Class: ● SocialTourism:Walk

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:Walking

INDIVIDUAL EDITOR for SocialTourism:Walking (instance of SocialTourism:Walk, owl:NamedIndividual)

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#Walking>

SocialTourism:Walk owl:NamedIndividual

SocialTourism:Transport_is_in

- ◆ SocialTourism:RioDeJaneiro

- SocialTourism:Position
 - SocialTourism:City (1)
 - SocialTourism:NaturalRegion
 - SocialTourism:CityCenter (1)
 - SocialTourism:Coastal (3)
 - SocialTourism:Lake (1)
 - SocialTourism:Mountain (1)

INSTANCE BROWSER

For Class: ● SocialTourism:Coastal

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:Arpoador
- ◆ SocialTourism:Copacabana
- ◆ SocialTourism:Ipanema

INDIVIDUAL EDITOR for SocialTourism:Copacabana (instance of SocialTourism:Coastal, owl:NamedIndividual)

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#Copacabana>

SocialTourism:Coastal owl:NamedIndividual

hasGPS_lat 23.1

hasGPS_long 43.2

SocialTourism:hasCity

- ◆ SocialTourism:RioDeJaneiro

- SocialTourism:User (1)

INSTANCE BROWSER

For Class: ● SocialTourism:User

Asserted Inferred

Asserted Instances

- ◆ SocialTourism:Susana

For Individual: <http://www.owl-ontologies.com/SocialTourism.owl#Susana>

SocialTourism:User owl:NamedIndividual

hasGPS_lat 23.2

hasGPS_long 43.3

SocialTourism:hasPosition

- ◆ SocialTourism:RioDeJaneiro

hasTransportRecommendations

- ◆ SocialTourism:Walking

$SocialTourism:User(?x) \wedge hasGPS_lat(?x, ?gpsl) \wedge hasGPS_long(?x, ?gpslong) \wedge SocialTourism:hasRecommendations(?x, ?act) \wedge SocialTourism:Activities_in(?act, ?natu) \wedge SocialTourism:hasTransport(?natu, ?transp) \wedge SocialTourism:NaturalRegion(?natu) \wedge hasGPS_lat(?natu, ?gpsnatl) \wedge hasGPS_long(?natu, ?gpsnatong) \wedge swrlb:subtract(?gpsl, ?gpsnatl, ?latitudediff) \wedge swrlb:subtract(?gpslong, ?gpsnatong, ?longitudediff) \wedge swrlb:lessThan(?latitudediff, 0.2) \wedge swrlb:lessThan(?longitudediff, 0.2) \rightarrow hasTransportRecommendations(?natu, SocialTourism:Walking)$
 $SocialTourism:User(?x) \wedge hasGPS_lat(?x, ?gpsl) \wedge hasGPS_long(?x, ?gpslong) \wedge SocialTourism:hasRecommendations(?x, ?act) \wedge SocialTourism:Activities_in(?act, ?natu) \wedge SocialTourism:hasTransport(?natu, ?transp) \wedge SocialTourism:NaturalRegion(?natu) \wedge hasGPS_lat(?natu, ?gpsnatl) \wedge hasGPS_long(?natu, ?gpsnatong) \wedge swrlb:subtract(?gpsl, ?gpsnatl, ?latitudediff) \wedge swrlb:subtract(?gpslong, ?gpsnatong, ?longitudediff) \wedge swrlb:greaterThanOrEqualTo(?latitudediff, 0.2) \wedge swrlb:greaterThanOrEqualTo(?longitudediff, 0.2) \rightarrow hasTransportRecommendations(?natu, SocialTourism:Metro)$

WITH WHOM?

This screenshot shows a class hierarchy on the left and an instance browser on the right. The class hierarchy includes 'Social', 'contact:Person', and 'foaf:Person (4)'. The instance browser is set for the class 'foaf:Person' and shows a list of 'Asserted Instances': foaf2:ana, foaf2:debora, foaf2:jose, and foaf2:me.

This screenshot shows the 'INDIVIDUAL EDITOR for foaf2:me (instance of foaf:Person, owl:NamedIndividual)'. The 'For Individual' field contains the URI 'file:/C:/Users/502054123/Desktop/Tourism/foaf.rdf#me'. The 'foaf:knows' property is expanded to show instances: foaf2:ana, foaf2:debora, and foaf2:jose. The 'hasInterest' property is expanded to show the instance 'SocialTourism:Surf'.

This screenshot shows the instance browser with 'foaf2:ana' selected. The 'foaf:knows' property is expanded to show the instance 'foaf2:me'. The 'hasInterest' property is expanded to show the instance 'SocialTourism:Surf'.

This screenshot shows the instance browser with 'foaf2:debora' selected. The 'foaf:knows' property is expanded to show the instance 'foaf2:me'. The 'hasInterest' property is expanded to show the instance 'SocialTourism:ClimbMountain'.

FOAF

1 Generate the .rdf file: <http://www.ldodds.com/foaf/foaf-a-matic>

← → www.ldodds.com/foaf/foaf-a-matic

Si tiene comentarios acerca de esta aplicación, u otras preguntas acerca de FOAF, por que no se une a [la lista de correo RDFWeb-dev?](#)

Actualización: Actualmente estoy escribiendo [FOAF-a-Matic Mark 2](#) una aplicación de escritorio para crear y administrar sus datos FOAF.

Los Formularios

Personal

Información acerca de usted, y como pueden contactarlo.

Título (Sr, Sra, Dr, etc)
Nombre/s
Apellido
Apodo
Su Dirección de Email
Homepage
Su Foto
Teléfono

Trabajo

Información acerca de su lugar de trabajo.

Homepage del Trabajo
Página describiendo su trabajo

Escuela

¿A que escuela fue?

Homepage de su Escuela

Gente Que Conoce

Informe a FOAF-a-matic acerca de la gente que conoce. Presione "Agregar Amigo" para agregar espacio para agregar más gente.

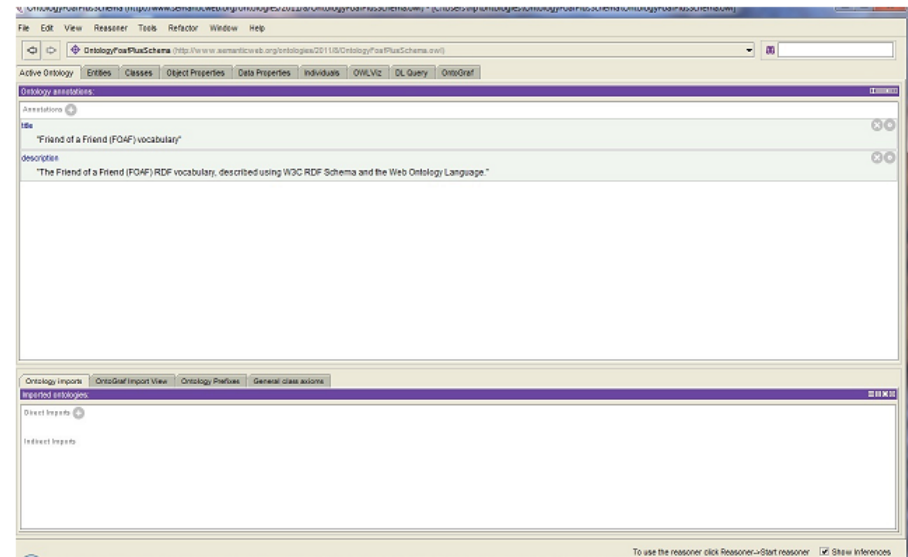
Amigo -- Nombre Email Ver Tambien
Amigo -- Nombre Email Ver Tambien
Amigo -- Nombre Email Ver Tambien

2 Open Protege 4.1

3 Open OWL Ontology and select the file created with FOAF-a-Matic

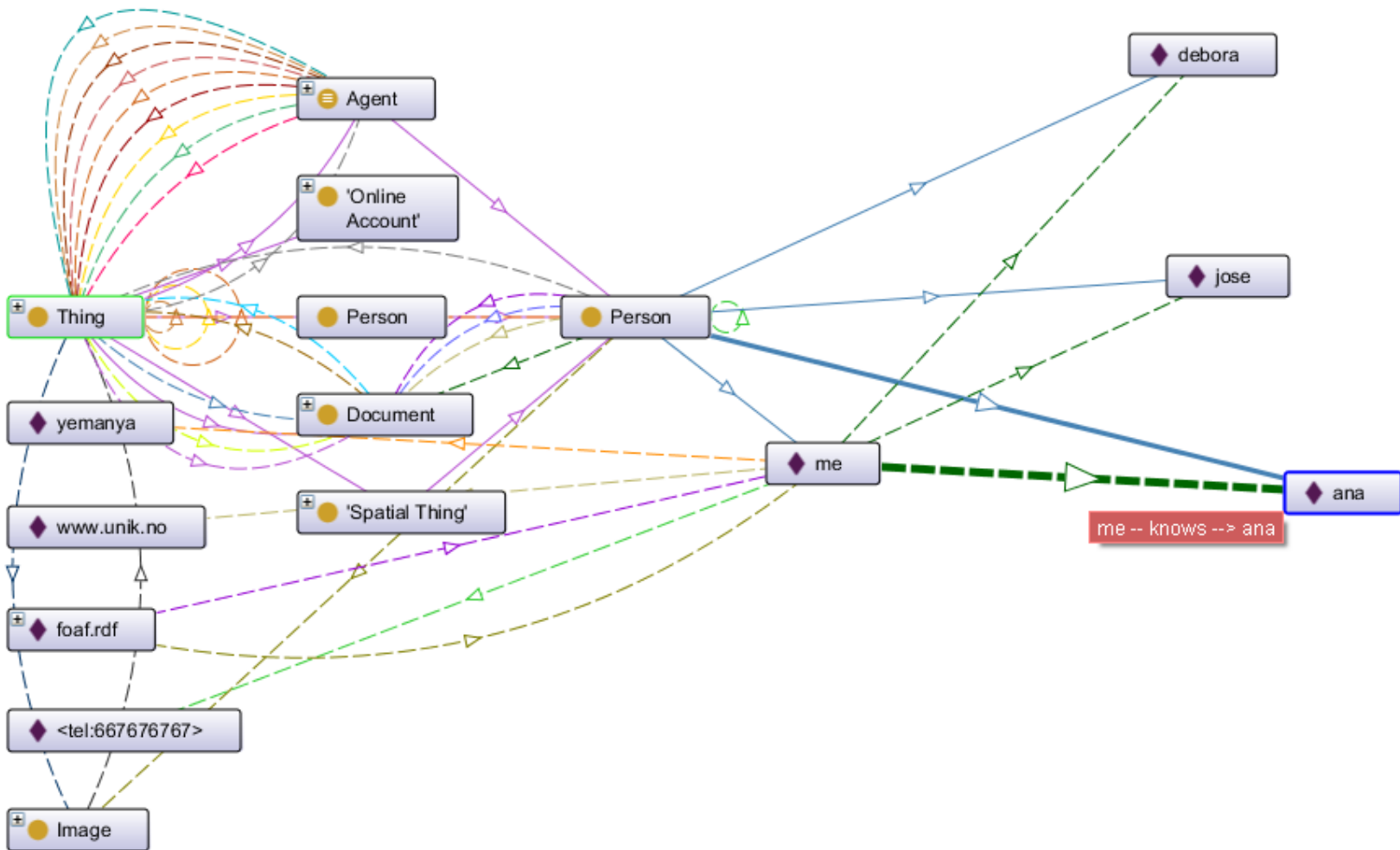
4 Import the file downloaded from <http://xmlns.com/foaf/spec/index.rdf>

5 Now in protege, go to Refactor->Merge Ontologies.



6 Go to Refactor -> Merge Ontologies again, and Add my ontology "E-Tourism"

FOAF SCHEMA



SPARQL & FOAF

The screenshot shows the Protégé 3.4.8 interface with the following components:

- CLASS BROWSER:** Shows a class hierarchy for 'Ontology_E-Tourism', including classes like foaf:LabelProperty, foaf:OnlineAccount, foaf:Project, owl:NamedIndividual (36), skos:Concept, terms:Agent, wgs84_pos:SpatialThing, SocialTourism:Activities, SocialTourism:Position, SocialTourism:Preferences, SocialTourism:AdventureRole (1), SocialTourism:CulturalRole (1), SocialTourism:Time, SocialTourism:Transport, SocialTourism:User (1), and swrl:Entity.
- INSTANCE BROWSER:** Shows 'Asserted Instances' for the class 'SocialTourism:User', listing 'SocialTourism:Susana'.
- INDIVIDUAL EDITOR:** Contains two SPARQL queries:
 - Red Boxed Query:**

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?name1 ?name2
FROM <http://www.semanticweb.org/ontologies/2012/4/OntologyPrueba.owl>
WHERE {
  ?person1 foaf:name ?name1 ;
    foaf:knows [ foaf:name ?name2 ];
}
```
 - Green Boxed Query:**

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?name1 ?name2
FROM <http://www.semanticweb.org/ontologies/2012/4/OntologyPrueba.owl>
WHERE {
  ?person1 foaf:knows ?person2 .
  ?person1 foaf:name ?name1 .
  ?person2 foaf:name ?name2 .
}
```
- Query Panel:** Shows the same SPARQL query as the green box, with an 'Execute Query' button.
- Results Panel:** Displays a table with two columns: 'name1' and 'name2'. The results are:

name1	name2
Susana Rodriguez	Jose
Susana Rodriguez	Debora
Susana Rodriguez	Ana
Jose	Susana Rodriguez
Debora	Susana Rodriguez
Ana	Susana Rodriguez

PELLET & SWOOP

- 1 Install SWOOP: <http://www.mindswap.org/2004/SWOOP/downloads/>
- 2 Install Java Webstart: <http://docs.oracle.com/javase/6/docs/technotes/guides/javaws/>
- 3 Add ontology:

The screenshot shows the SWOOP 2.3beta4 interface. The main window displays the 'Ontology Info' tab for 'OntologyPrueba.owl'. The 'Annotations' section shows the title and description. The 'Imports' section lists two URIs. The 'Advanced Ontology Statistics' section provides a summary of the ontology's structure, including the number of classes, properties, and individuals. A table below this section provides detailed statistics for General, Property Tree, and Satisfiable Class Tree.

General Statistics	Property Tree Statistics	Satisfiable Class Tree Statistics
DL Expressivity: ALCHIF(D) No. of <i>GCI</i> s: 1 No. of <i>Sub-classes</i> : 43 No. of <i>Disjoint Axioms</i> : 21 No. of <i>Functional Properties</i> : 18 No. of <i>Inverse Functional Properties</i> : 15 No. of <i>Transitive Properties</i> : 0 No. of <i>Symmetric Properties</i> : 0 No. of <i>Inverse Properties</i> : 10	Properties with <i>Multiple Inheritance</i> : 1 Max. Depth of Property Tree: 7 Min. Depth of Property Tree: 7 Avg. Depth of Property Tree: 7	Classes with <i>Multiple Inheritance</i> : 1 Max. Depth of Class Tree: 4 Min. Depth of Class Tree: 1 Avg. Depth of Class Tree: 2.4 Max. Branching Factor of Class Tree: 12 Min. Branching Factor of Class Tree: 1 Avg. Branching Factor of Class Tree: 3.2

- 4 Check inconsistencies:

The screenshot shows the SWOOP 2.3beta4 interface with a warning for an inconsistent ontology. The 'OWL Ontology' section is highlighted in red. The 'Reason' section explains the inconsistency: 'Individual Mediumwaves has more than one value for the functional property waveMeters'. The 'Axioms causing the problem' section lists six axioms. The 'Advanced Ontology Statistics' section is also visible at the bottom.

Inconsistent ontology
Reason: Individual [Mediumwaves](#) has more than one value for the functional property [waveMeters](#)

Axioms causing the problem:

- 1) Functional Property ([Activity_Available](#))
- 2) Functional Property ([waveMeters](#))
- 3) Functional Property ([hasGPS_lat](#))
- 4) ([Arapador](#) [hasGPS_lat](#) "22.98"^^xsd:float>)
- 5) ([Mediumwaves](#) [waveMeters](#) "2"^^xsd:string>)
- 6) Functional Property ([hasGPS_long](#))

Conclusions

- You need Protege 4.1 for merging ontologies.
- You can check the ontology inconsistencies if you install «Swoop». It includes «Pellet reasoner».
- Incorrect answers when you are creating rules. Sometimes you have to close/re-open Protege for running a new rule.

REFERENCES & MATERIAL

- Protege 4.1
- Protege 3.4.8
- Swoop
- Java Webstart
- Swoop:<http://www.mindswap.org/2004/SWOOP/media/>
- SPARQL:<http://www.slideshare.net/ldodds/sparql-tutorial>

THANK YOU 😊