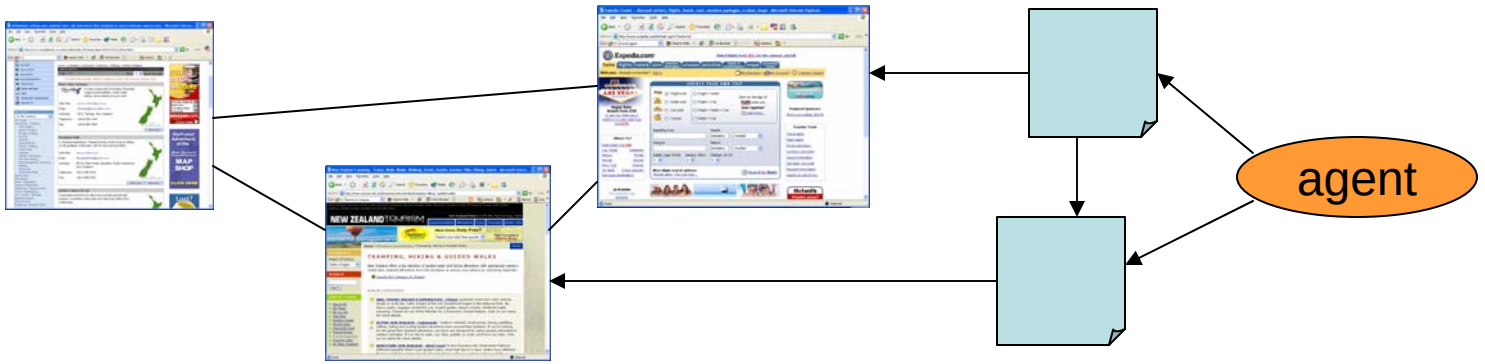
Protégé-OWL and the Semantic Web

8th Int. Protégé Conference, Madrid, July 2005

Holger Knublauch

The Semantic Web

Vision



Standards

W3C®

RDF

OWL

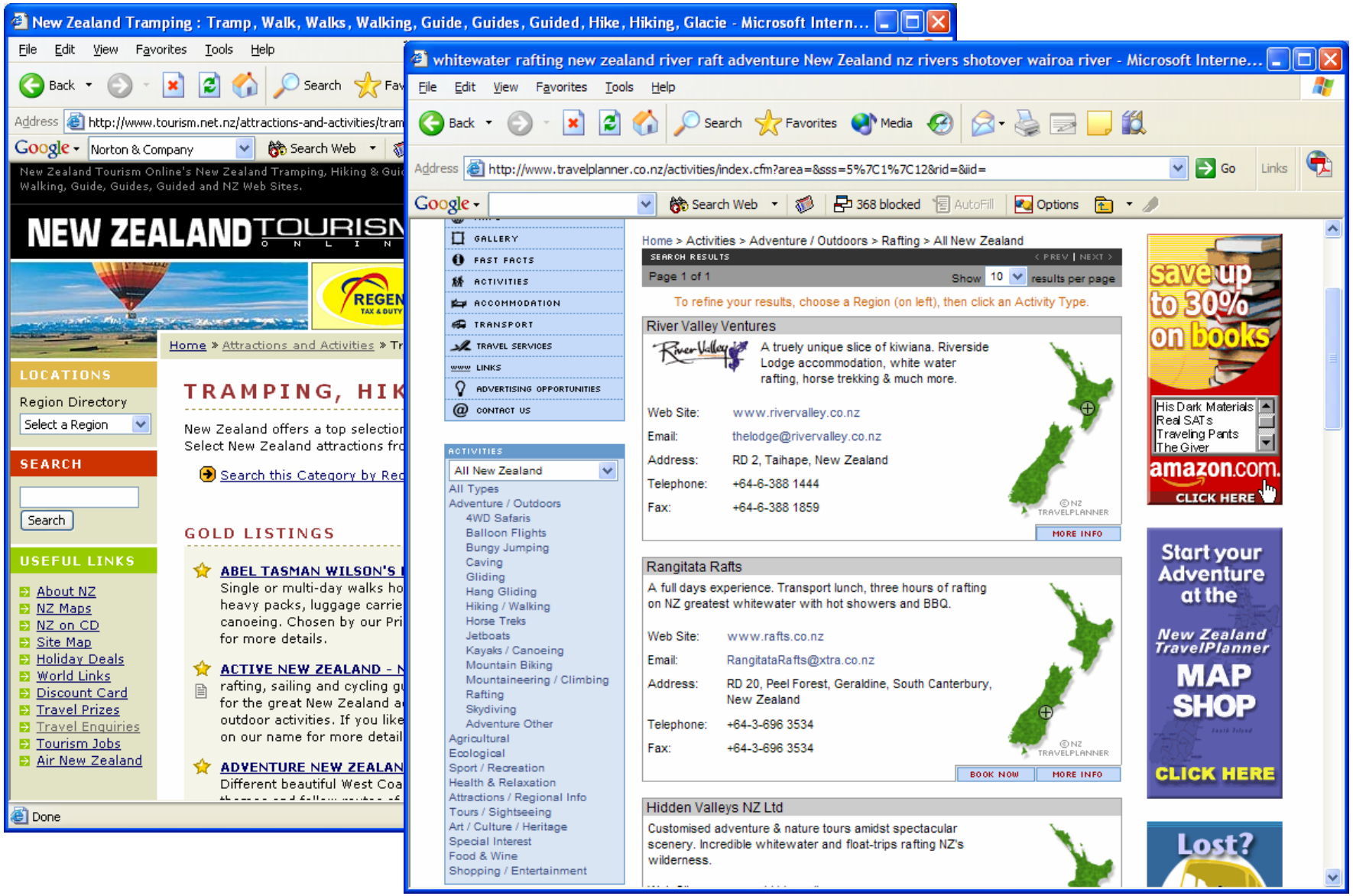
Technology

Jena
Semantic Web
Framework

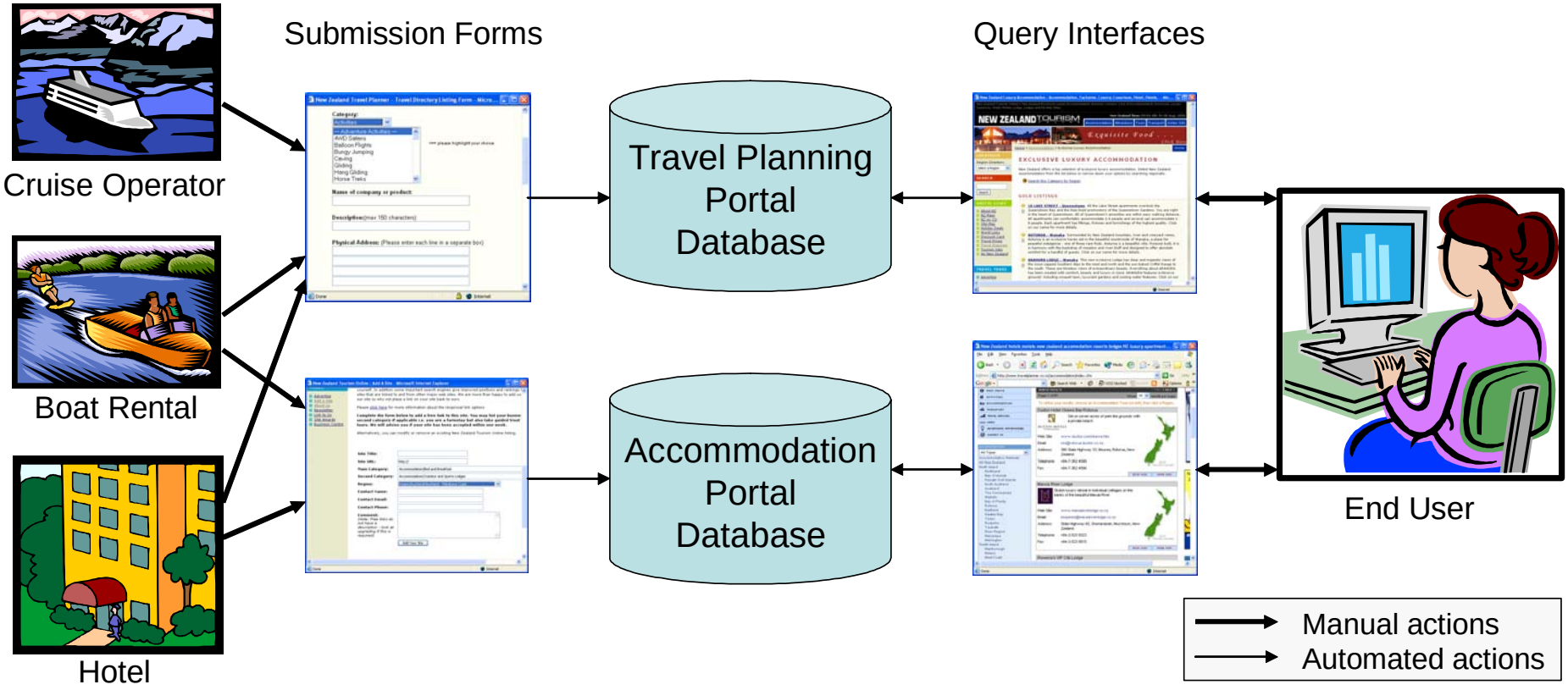
Racer

protégé

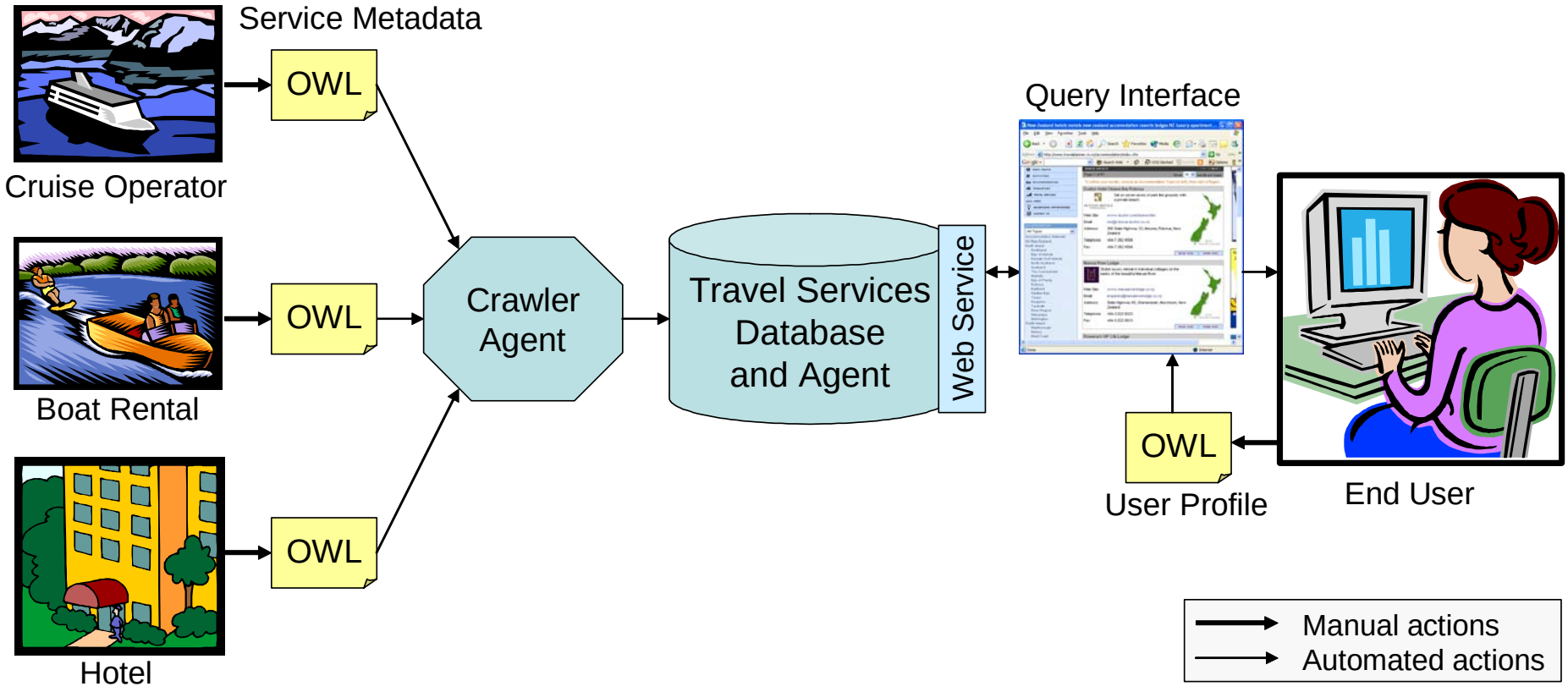
Example Scenario



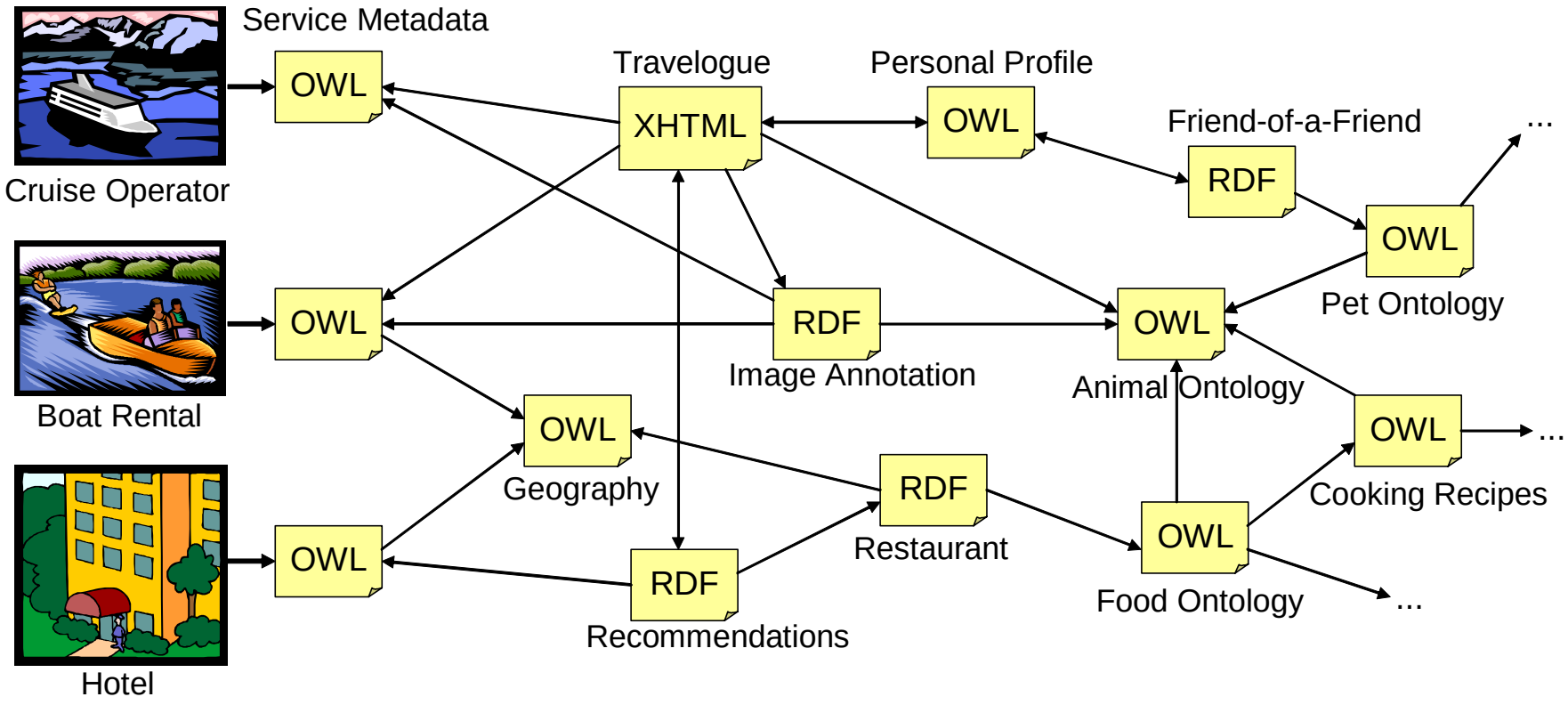
Traditional Web Architecture



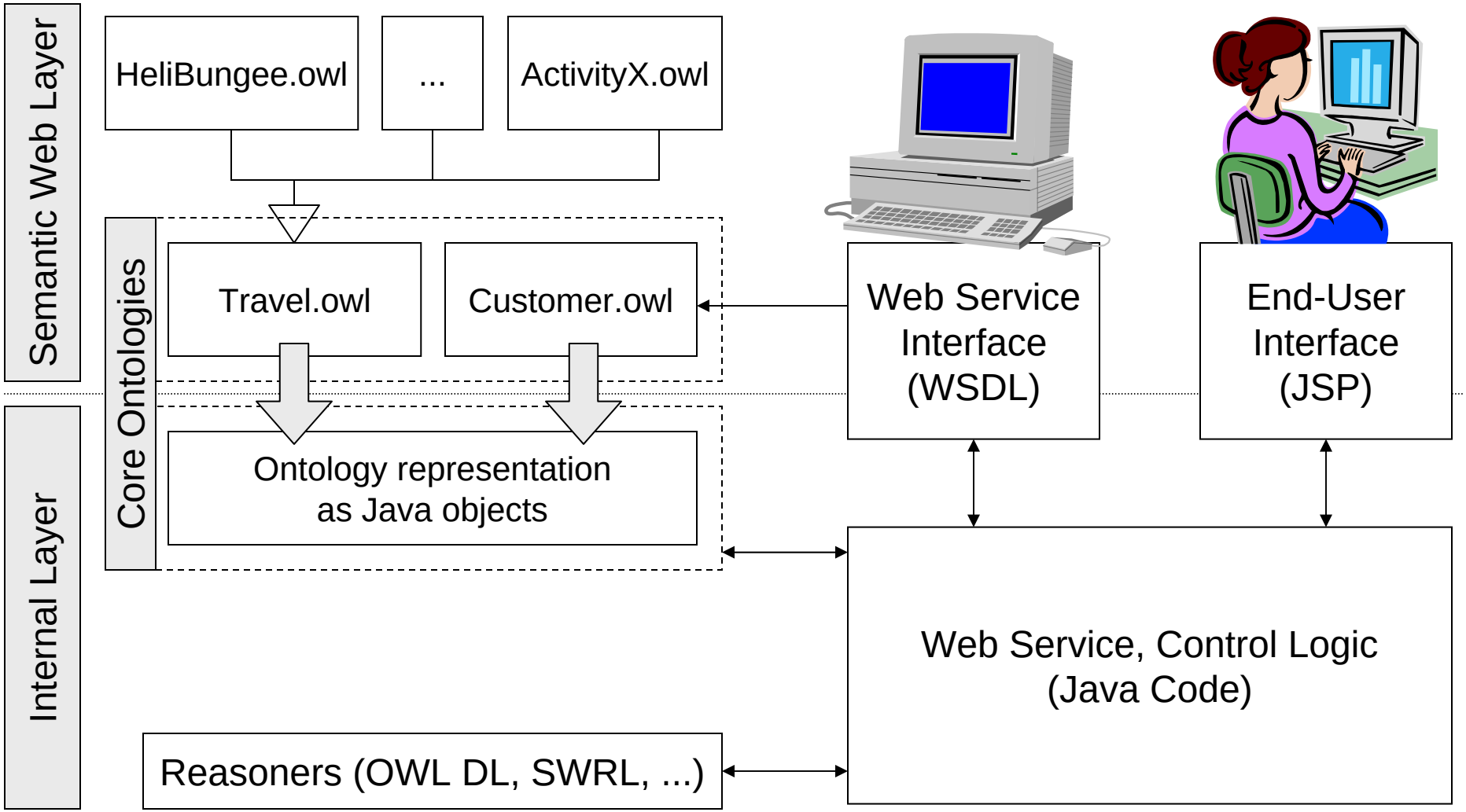
Semantic Web Architecture



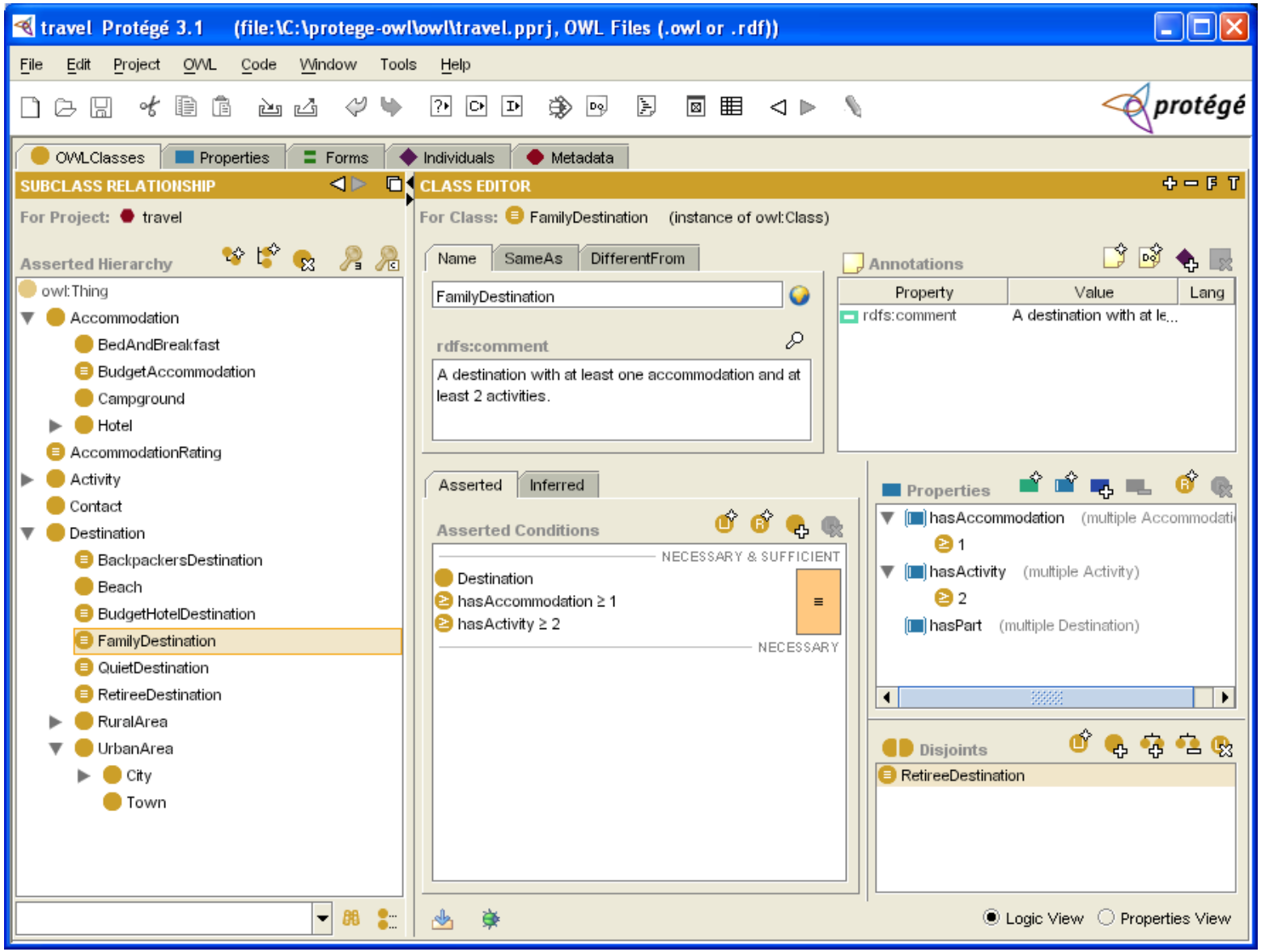
Semantic Web Evolution



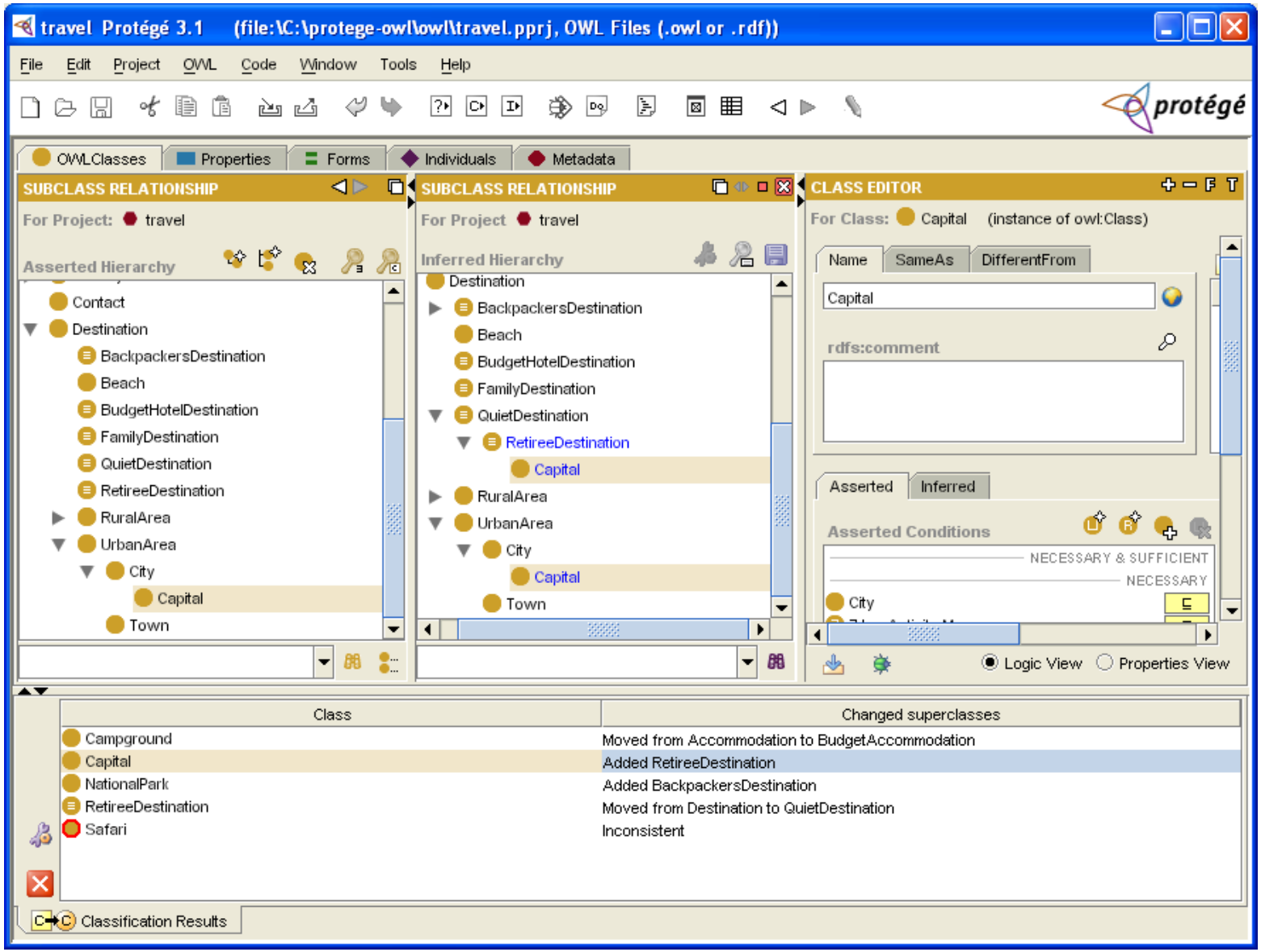
Software Architecture (1)



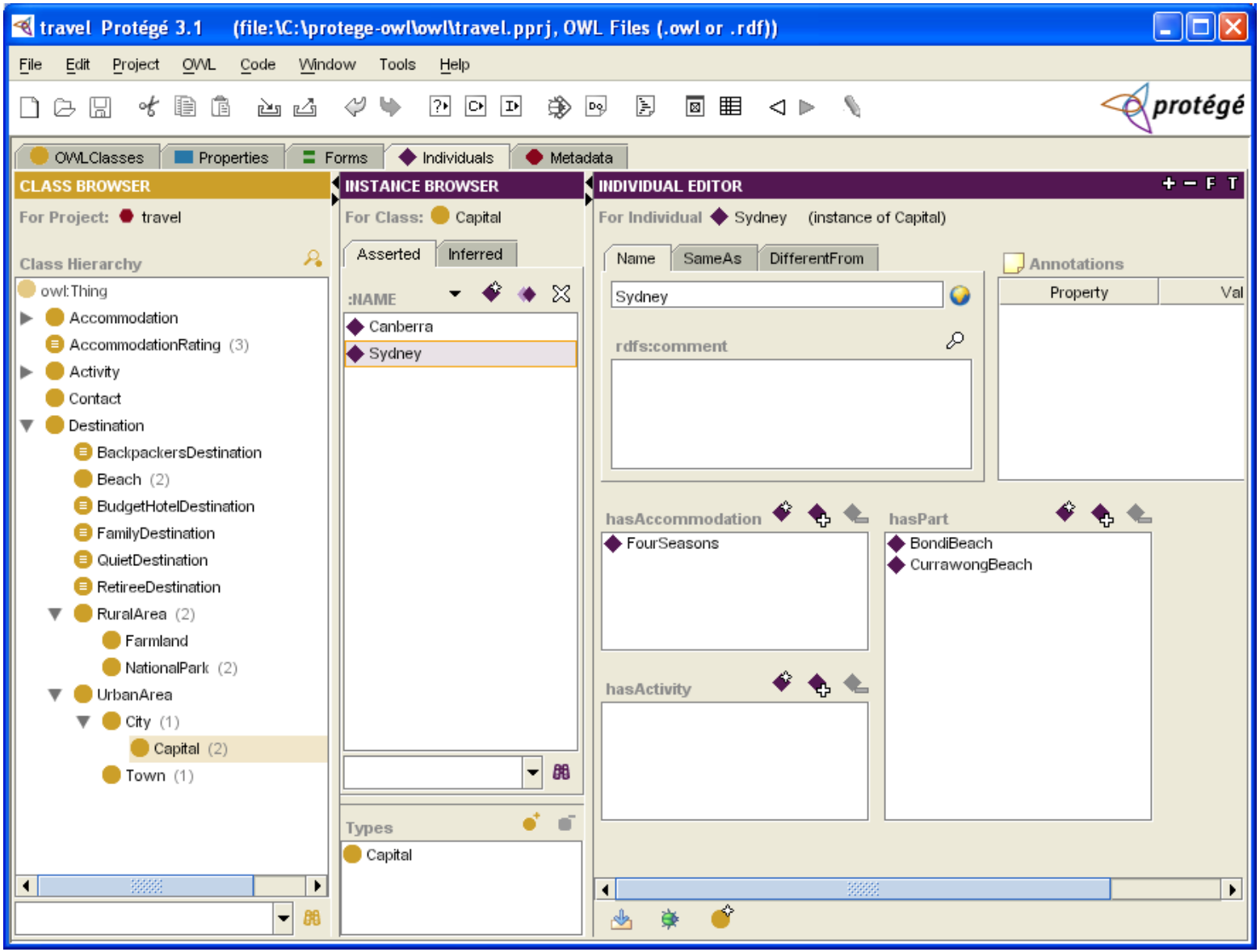
Protege-OWL


travel Protégé 3.1 (file:\C:\protege-owl\owl\travel.pprj, OWL Files (.owl or .rdf))
File Edit Project OWL Code Window Tools Help
protégé
OWLClasses Properties Forms Individuals Metadata
SUBCLASS RELATIONSHIP
For Project: travel
Asserted Hierarchy
owl:Thing
Accommodation
BedAndBreakfast
BudgetAccommodation
Campground
Hotel
AccommodationRating
Activity
Contact
Destination
BackpackersDestination
Beach
BudgetHotelDestination
FamilyDestination
QuietDestination
RetireeDestination
RuralArea
UrbanArea
City
Town
CLASS EDITOR
For Class: FamilyDestination (instance of owl:Class)
Name SameAs DifferentFrom
FamilyDestination
rdfs:comment
A destination with at least one accommodation and at least 2 activities.
Annotations
Property Value Lang
rdfs:comment A destination with at le...
Asserted Inferred
Asserted Conditions
NECESSARY & SUFFICIENT
Destination
hasAccommodation ≥ 1
hasActivity ≥ 2
≡
NECESSARY
Properties
hasAccommodation (multiple Accommodati
1
hasActivity (multiple Activity)
2
hasPart (multiple Destination)
Disjoints
RetireeDestination
Logic View
Properties View

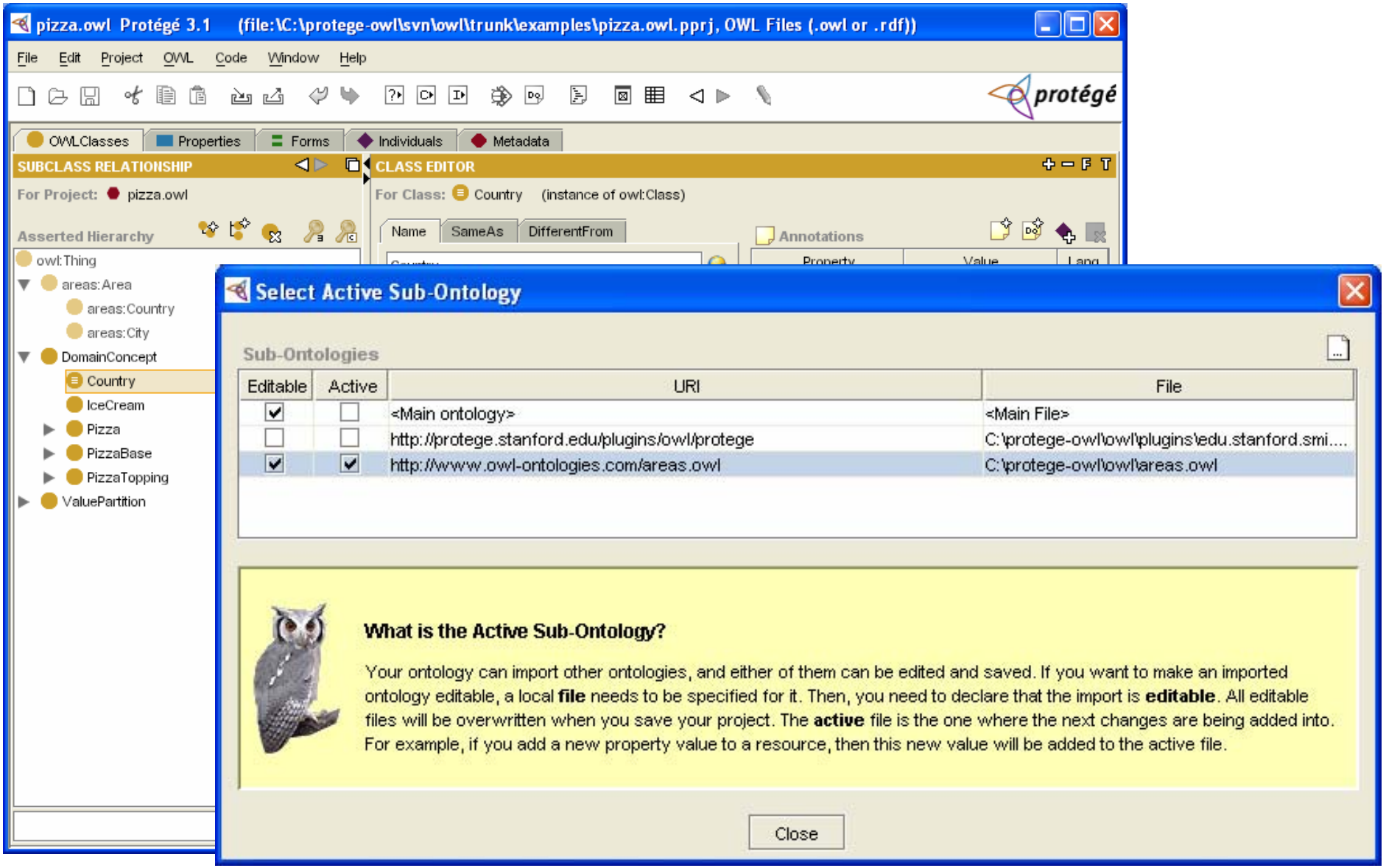
Protege-OWL Classification



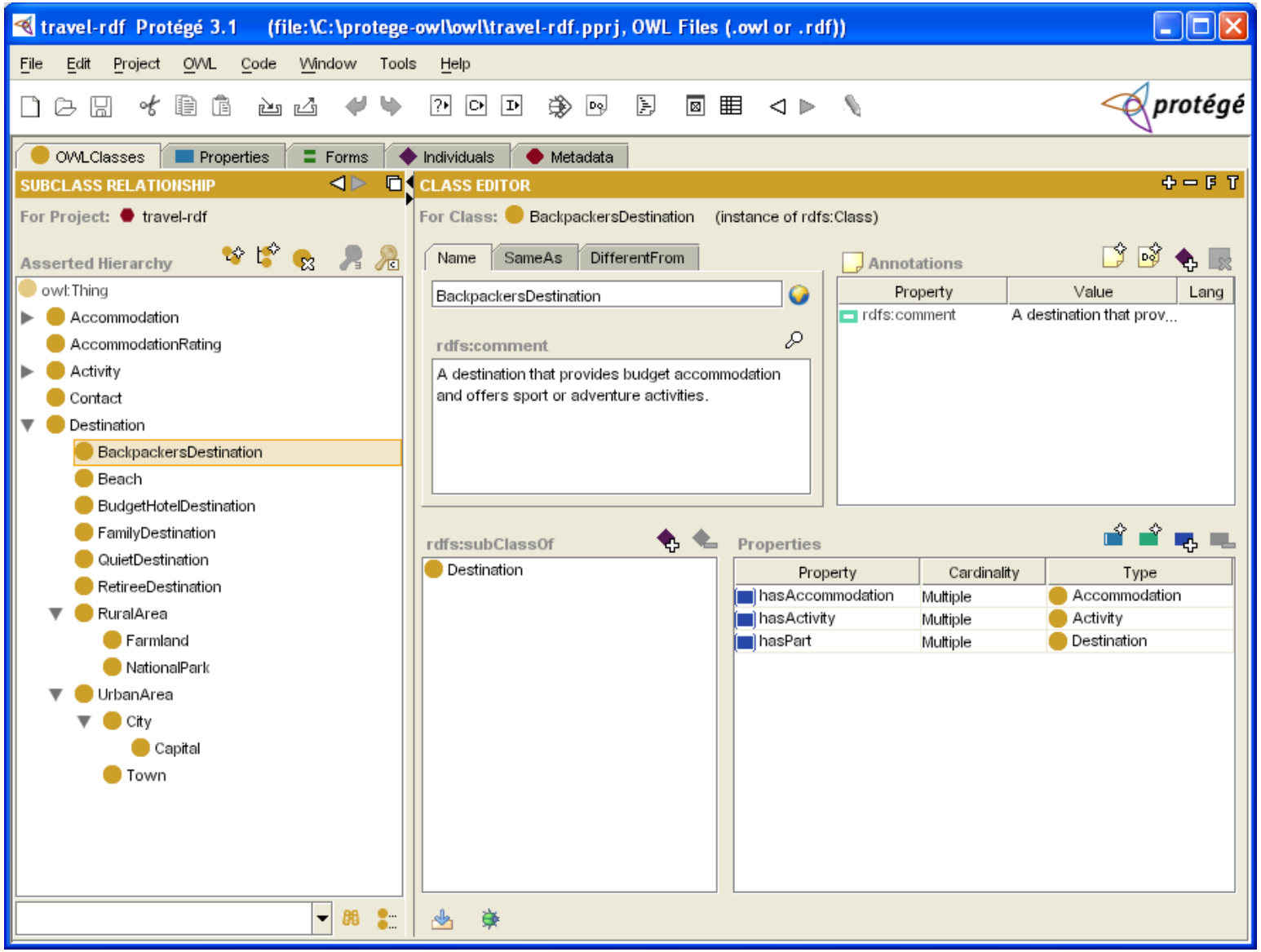
Protege-OWL Individuals



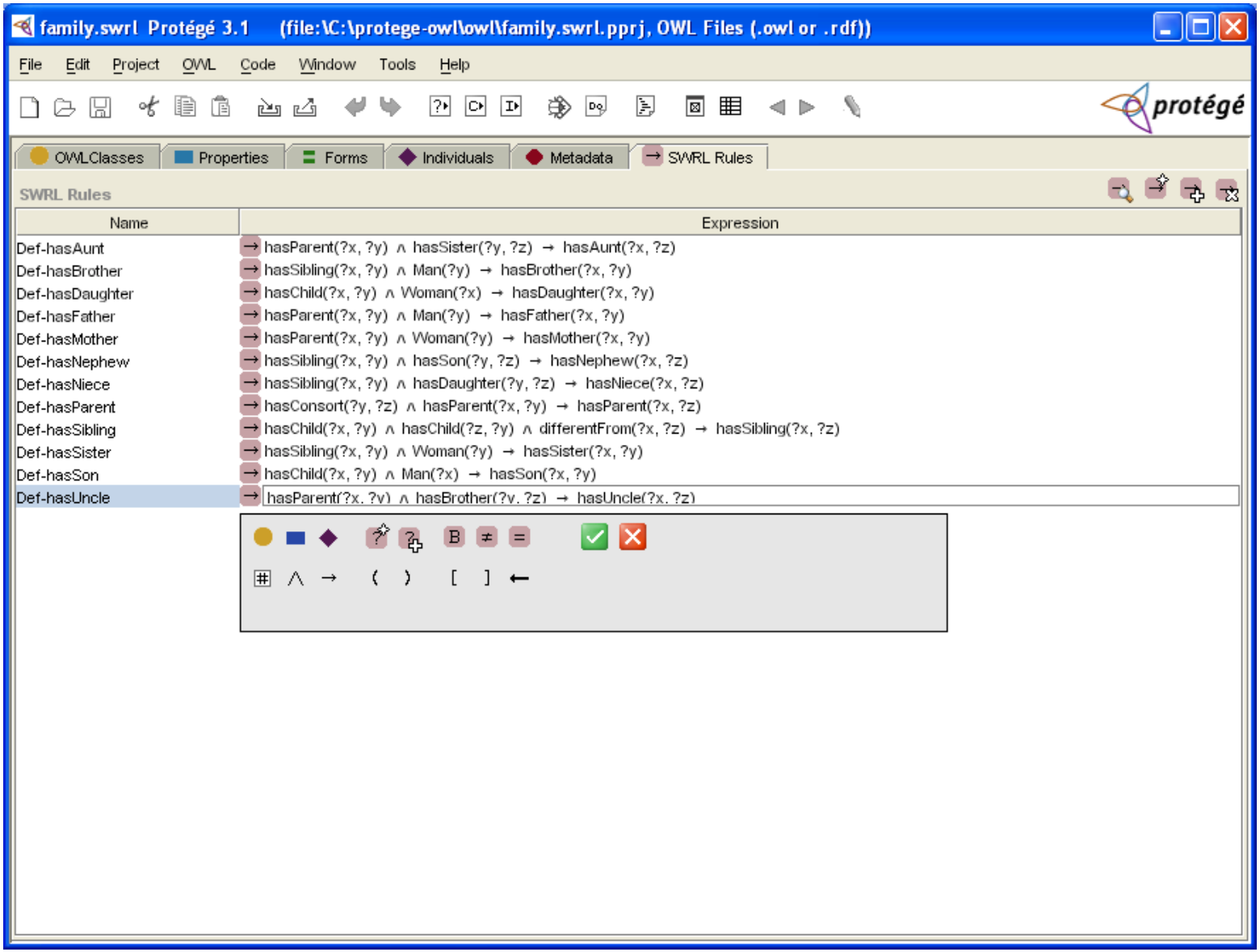
Working with Multiple Files



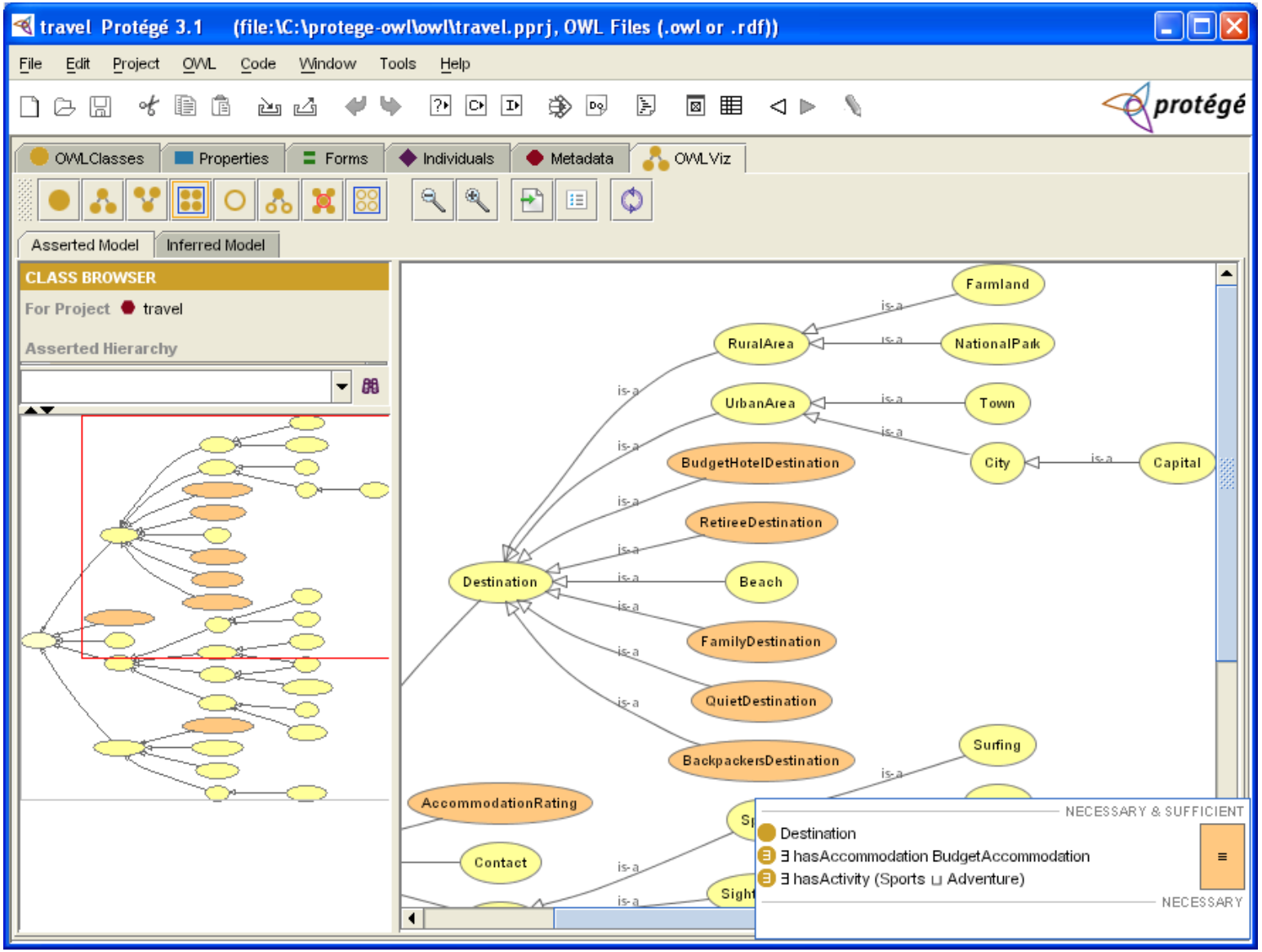
Protege-OWL for RDF(S)



Protege-OWL for SWRL

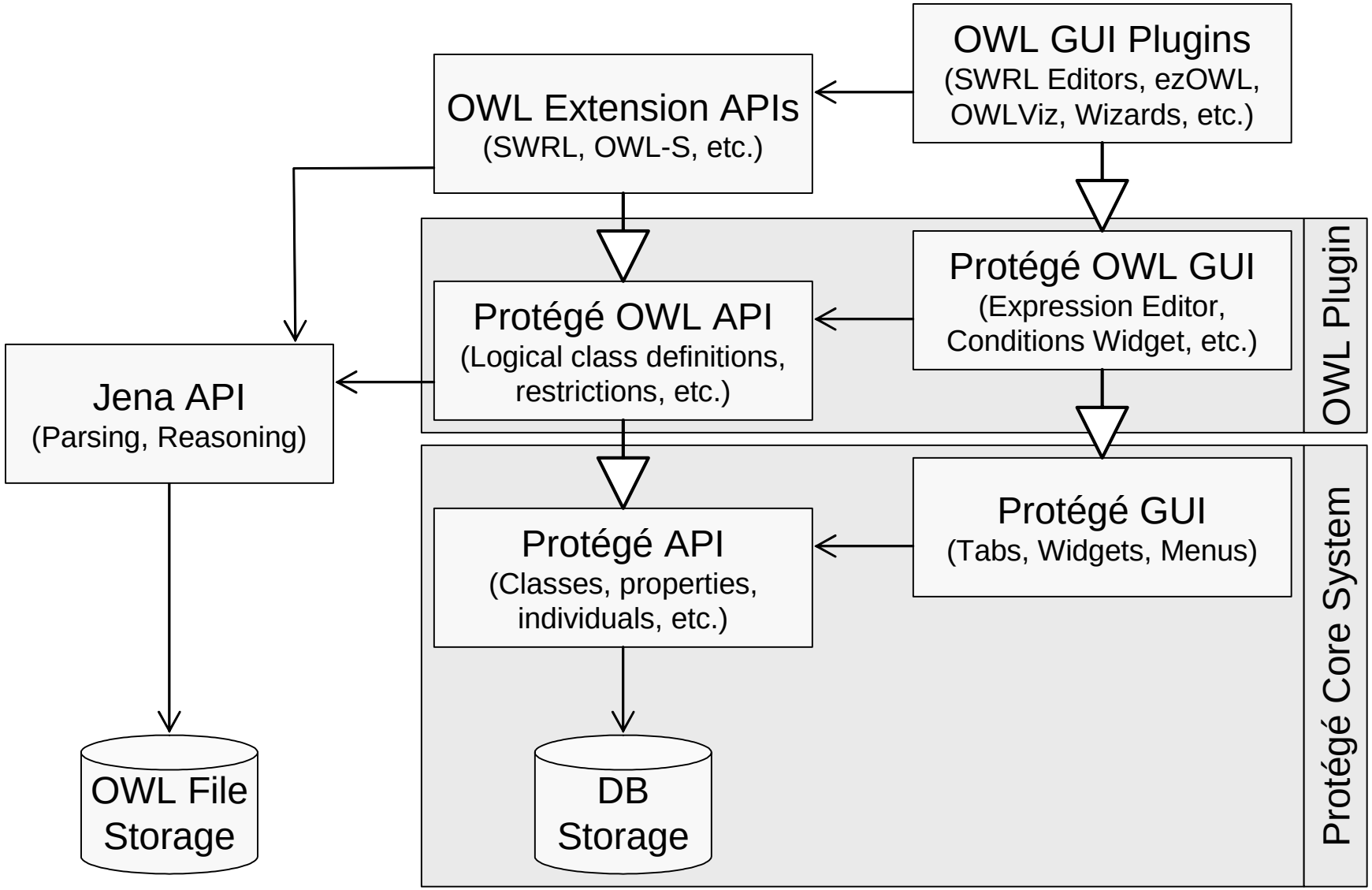


Protege-OWL Plugins

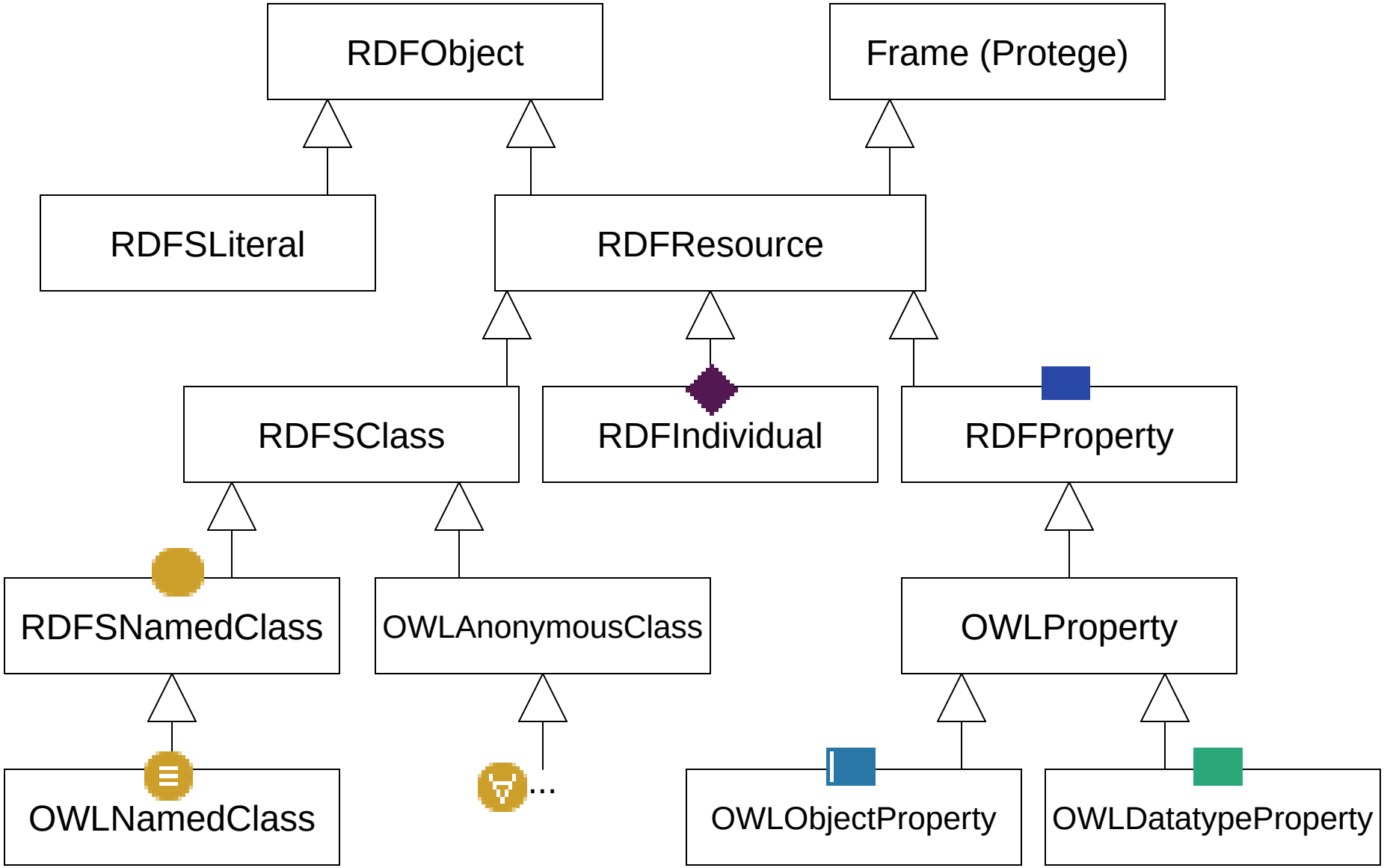


http://www.co-ode.org

Protege-OWL Architecture



Protege-OWL API (Model)



Protege-OWL API Example

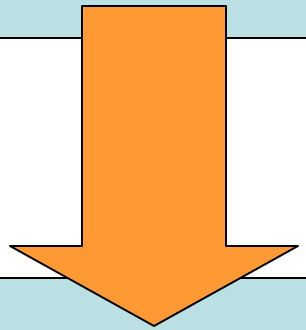
```
JenaOWLModel owlModel = ProtegeOWL.createJenaOWLModel();

RDFSNamedClass personClass =
        owlModel.createRDFSNamedClass("Person");
RDFProperty ageProperty = owlModel.createRDFProperty("age");
ageProperty.setRange(owlModel.getXSDint());
ageProperty.setDomain(personClass);

RDFIndividual individual = personClass.createRDFIndividual("Holger");
individual.setPropertyValue(ageProperty, new Integer(34));
```

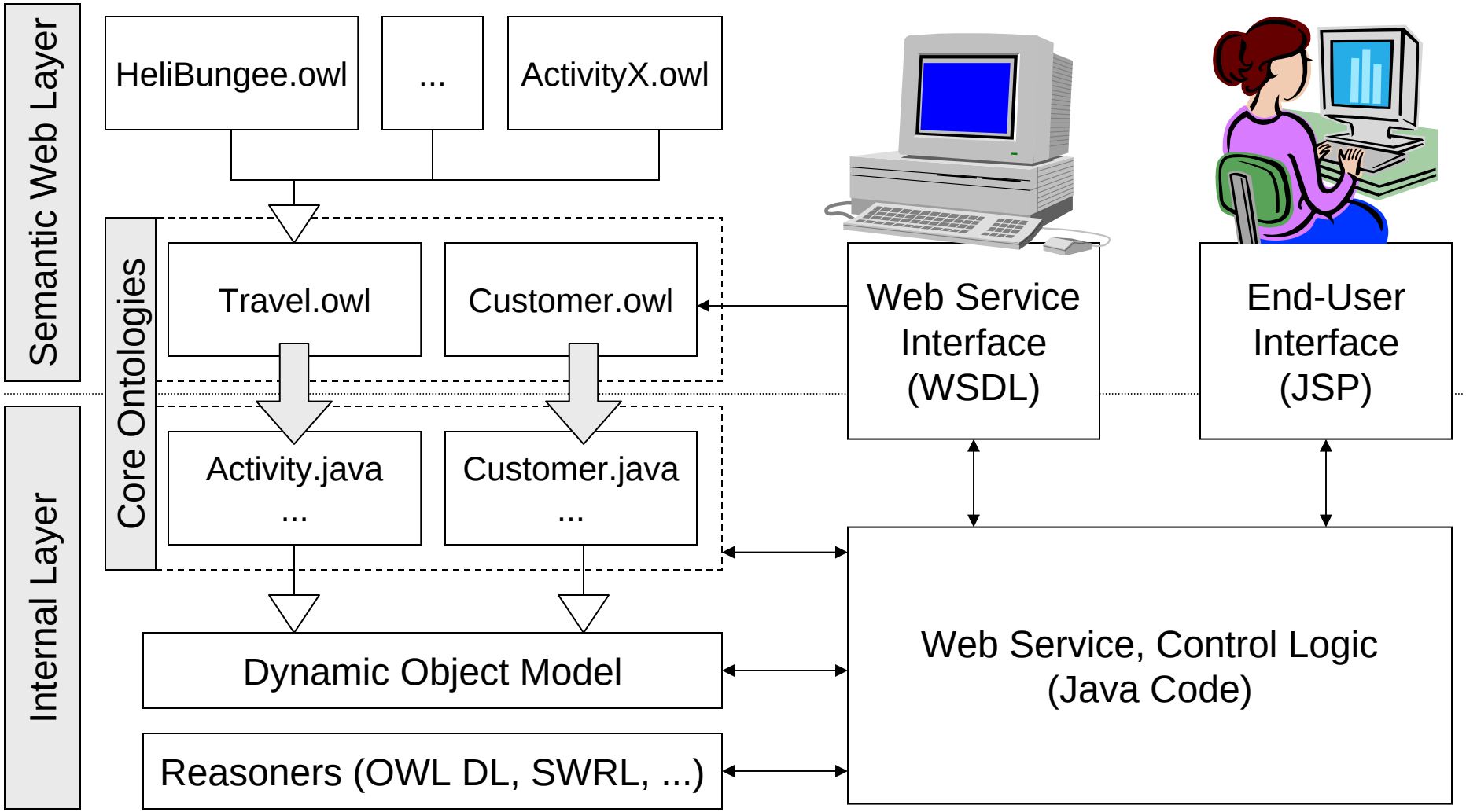
Java Code Generation

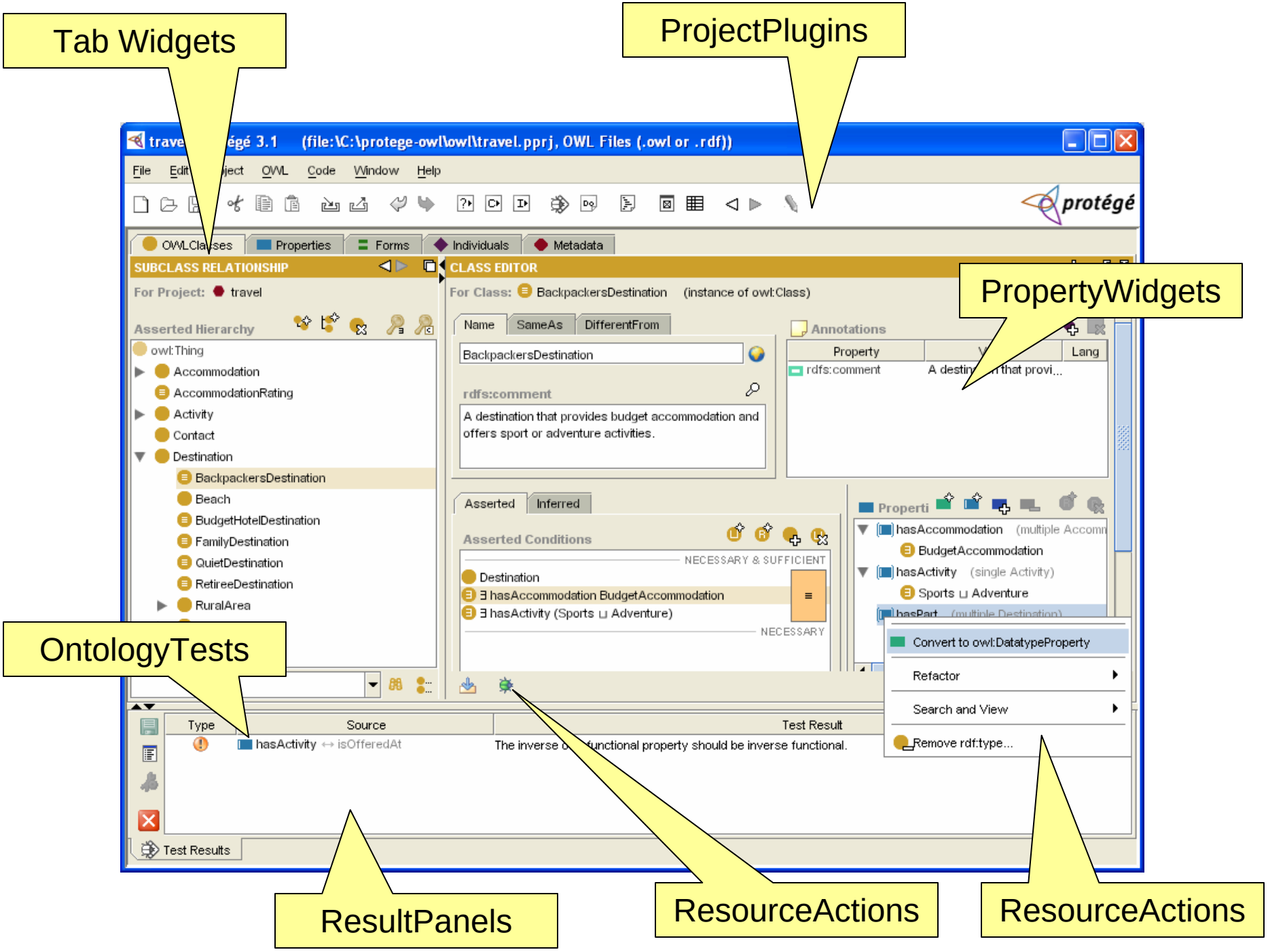
```
RDFIndividual individual = personClass.createRDFIndividual("Holger");
individual.setPropertyValue(ageProperty, new Integer(34));
```



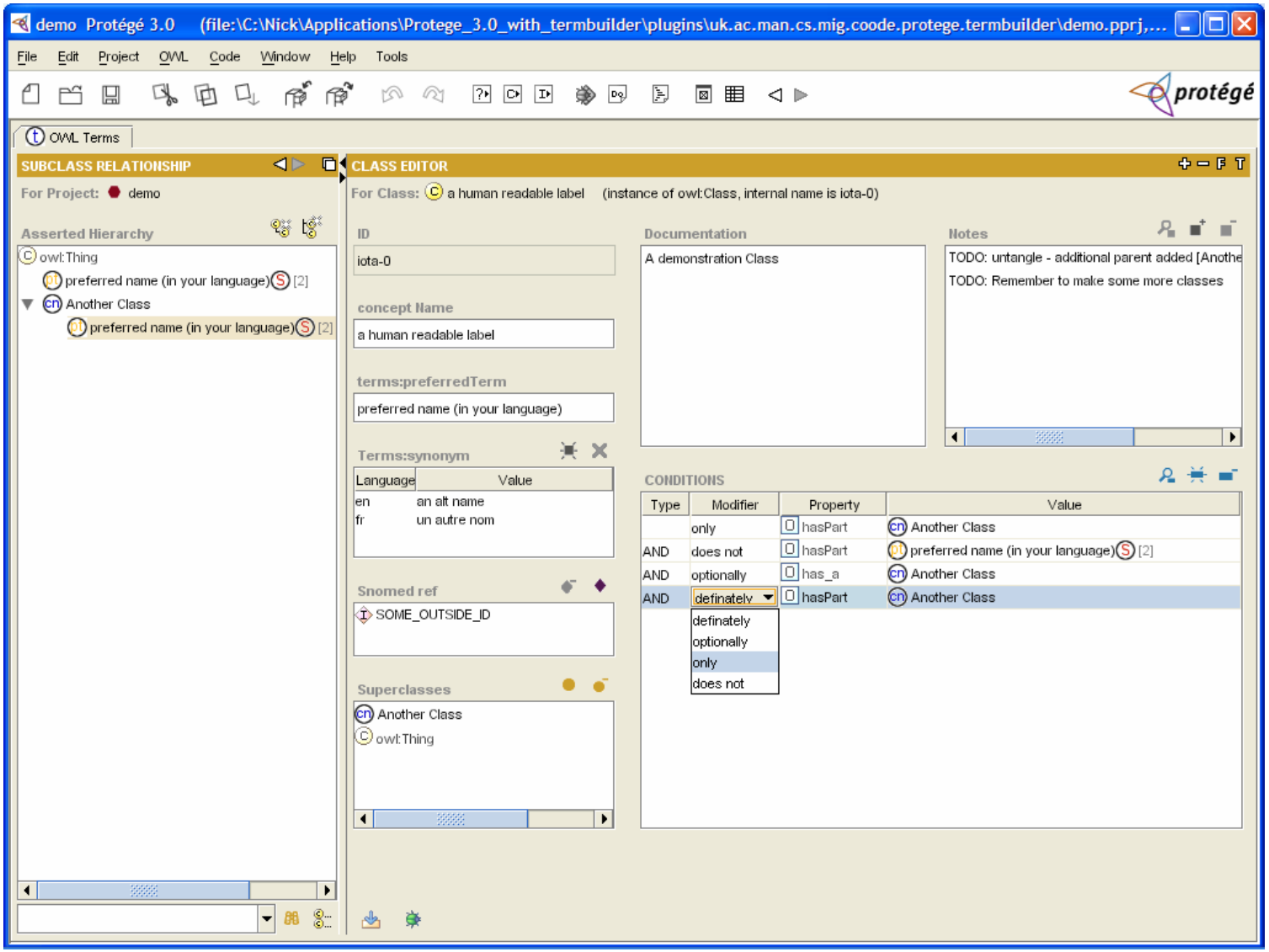
```
Person individual = factory.createPerson("Holger");
individual.setAge(34);
```

Software Architecture (2)



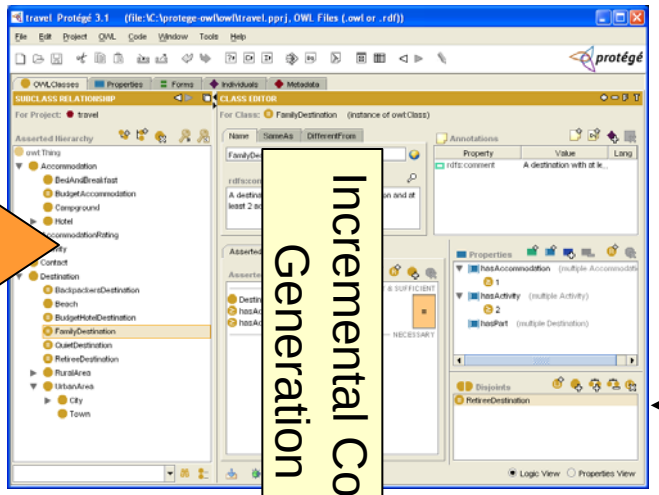

Tab Widgets
ProjectPlugins
PropertyWidgets
OntologyTests
ResultPanels
ResourceActions
ResourceActions
(file:\C:\protege-owl\owl\travel.pprj, OWL Files (.owl or .rdf))
File
Code
Window
Help
protégé
OWLClasses
Properties
Forms
Individuals
Metadata
SUBCLASS RELATIONSHIP
CLASS EDITOR
For Project: travel
For Class: BackpackersDestination (instance of owl:Class)
Asserted Hierarchy
owl:Thing
Accommodation
AccommodationRating
Activity
Contact
Destination
BackpackersDestination
Beach
BudgetHotelDestination
FamilyDestination
QuietDestination
RetireeDestination
RuralArea
Name
SameAs
DifferentFrom
BackpackersDestination
rdfs:comment
A destination that provides budget accommodation and offers sport or adventure activities.
Annotations
Property
Lang
rdfs:comment
Asserted
Inferred
Asserted Conditions
NECESSARY & SUFFICIENT
Destination
∃ hasAccommodation BudgetAccommodation
∃ hasActivity (Sports ⊔ Adventure)
NECESSARY
hasAccommodation
BudgetAccommodation
hasActivity
(single Activity)
Sports ⊔ Adventure
Convert to owl:DatatypeProperty
Refactor
Search and View
Remove rdf:type...
Type
Source
Test Result
hasActivity ↔ isOfferedAt
Test Results

Configuring Protege

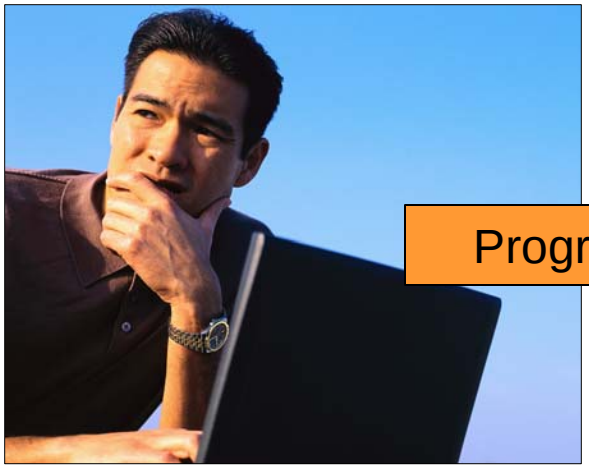


Protege-Driven Development

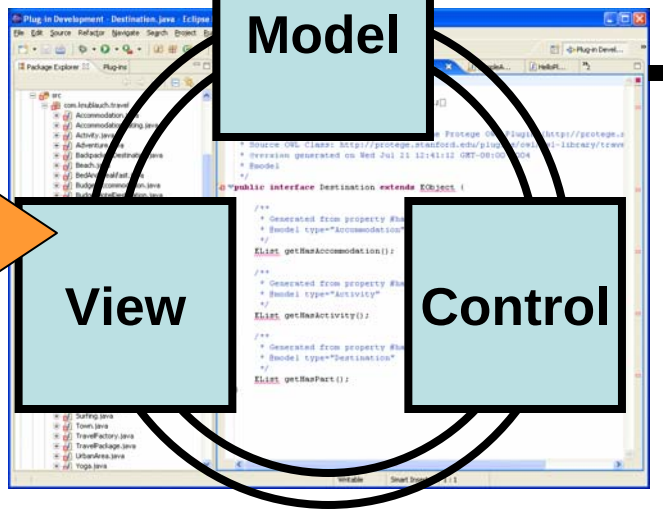
Domain Modeling



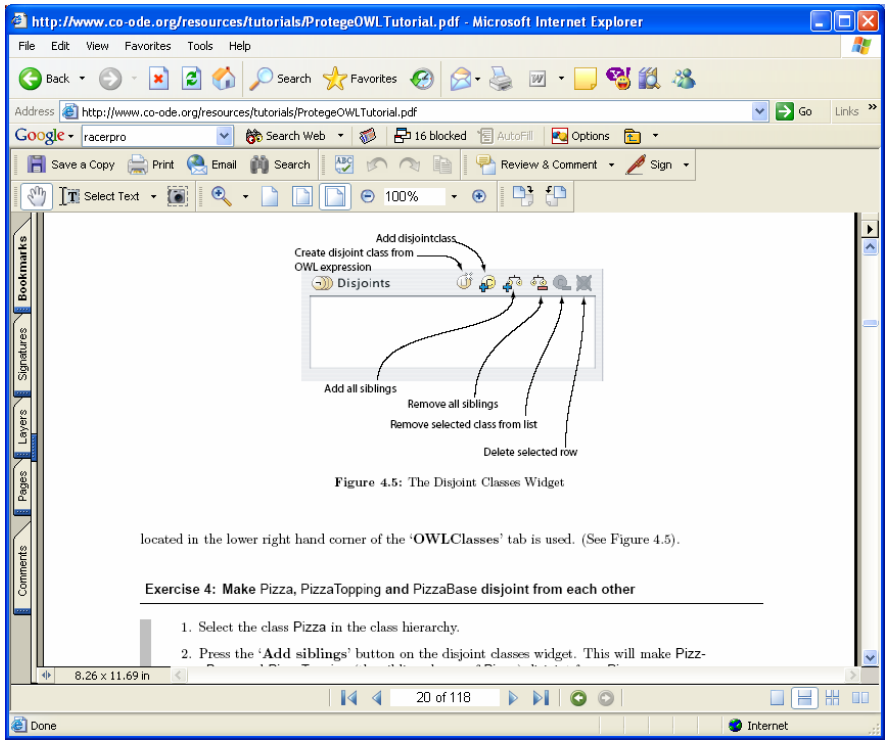
Incremental Code Generation

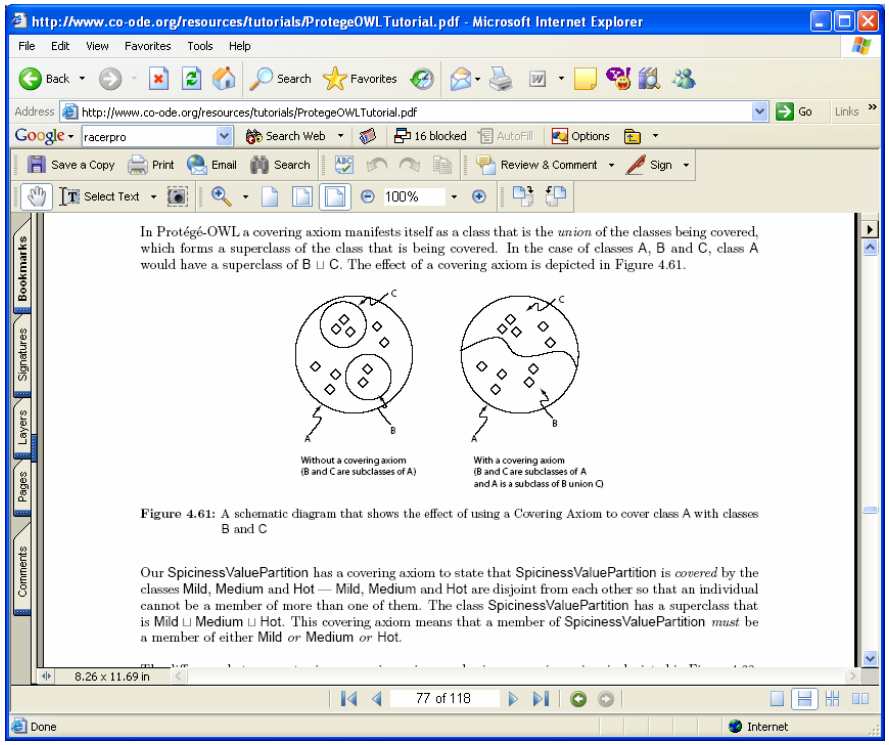


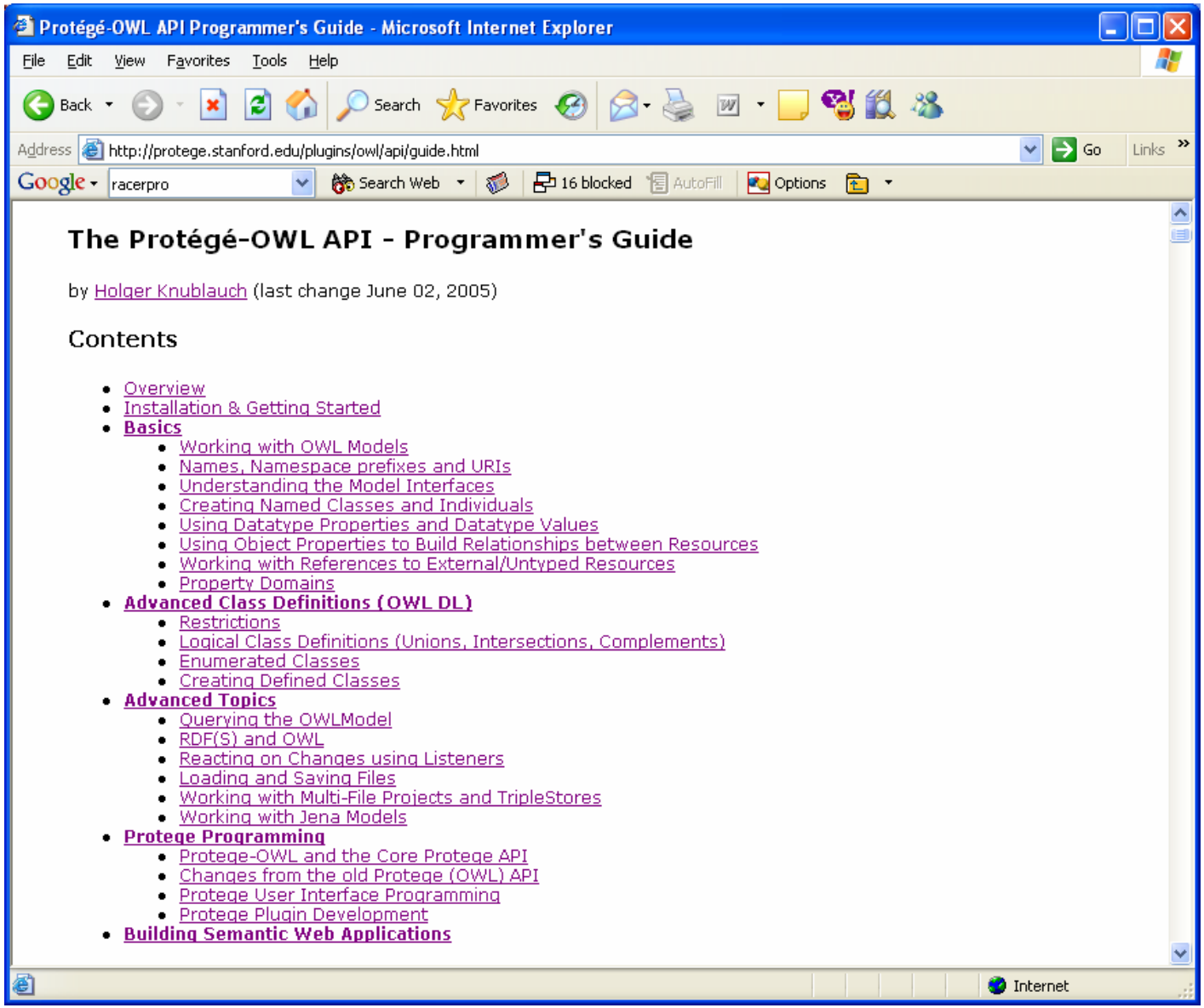
Programming



Further Reading (1)





http://www.co-ode.org

Further Reading (2)