



KNOWDIVE



KDI ● **Knowledge and Data Integration**

Protégé

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1 Ontology and Protégé

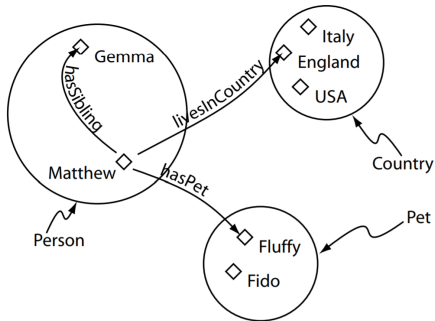
2 Protégé

Ontology and Protégé

- “An ontology is a formal, explicit specification of a shared conceptualization”
-by Gruber (1993) and modified by Studer et. al (1998)
- Ontologies are used to capture knowledge about some domain of interest. An ontology describes the concepts in the domain and also the relationships that hold between those concepts
- Protégé [1], [2] is a free, open-source ontology editor and framework for building intelligent systems. It was developed by the Stanford Center for Biomedical Informatics Research at the Stanford University School of Medicine.

Classes

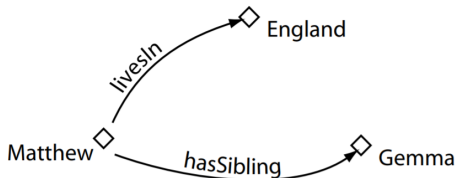
Classes are interpreted as sets that contain individuals.



Properties

Properties are binary relations on individuals - i.e. properties link two individuals together.

For example, the property `hasSibling` might link the individual Matthew to the individual Gemma, or the property `livesIn` might link the individual Matthew to the individual England.



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Protégé Desktop Interface (Active Ontology Tab)

File Edit View Reasoner Tools Refactor Window Mastro Ontop Help

pizza (http://www.co-ode.org/ontologies/pizza/2.0.0) : [https://protege.stanford.edu/ontologies/pizza/pizza.owl]

Active ontology × Entities × Individuals by class × OWLViz × DL Query × Individual Hierarchy Tab × OntoGraf × CoModIDE × SPARQL Query ×

Ontology header:

Ontology IRI: <http://www.co-ode.org/ontologies/pizza/>

Ontology Version IRI: <http://www.co-ode.org/ontologies/pizza/2.0.0>

Annotations +

- `rdfs:label` [type: xsd:string] pizza
- `dc:title` [language: en] pizza
- `dc:description` [language: en] An ontology about pizzas and their toppings.
- `dc:terms:license` [type: xsd:string]

This is an example ontology that contains all constructs required for the various versions of the Pizza Tutorial run by Manchester University (see <http://owl.cs.manchester.ac.uk/publications/talks-and-tutorials/protg-owl-tutorial>).

Ontology imports | Ontology Prefixes | General class axioms

Imported ontologies

Direct Imports +

Indirect Imports

Ontology metrics:

Metrics	
Axiom	801
Logical axiom count	322
Declaration axioms count	120
Class count	100
Object property count	8
Data property count	0
Individual count	5
Annotation Property count	12
Class axioms	
SubClassOf	259
EquivalentClasses	15
DisjointClasses	14

To use the reasoner click Reasoner > Start reasoner Show Inferences

WebProtégé Interface

WebProtégé - Chromium

webprotege.stanford.edu | ListColl+Home

Sign In Help Sign up for account

WebProtégé

Home

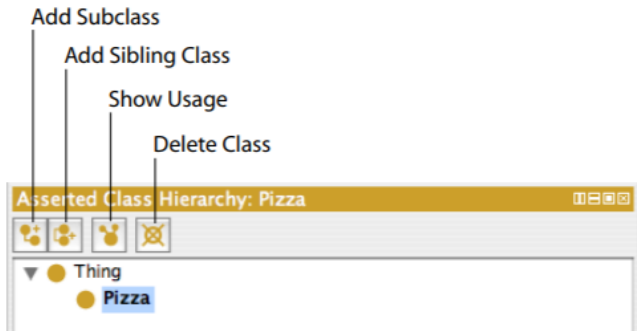
Create Project Upload Project

Project Name	Description	Owner	Download
Aero	An ontology about commercial aviation	M Horridge	Download
Agricultural Technology ontology	Agricultural Technology ontology	soonho	Download
Anatomia	Ontología sobre Anatomía desarrollada en la asignatura Ingeniería de Sistemas de Información, Máster en Ing. Informática, Universidad Carlos III de Madrid. Autores: Miguel Carvajal, Vicente Domínguez y Alexandra Tiemblo	Walabi42	Download
Area	The heirarchy of class place with subclasses like country, state and city along with its properties accompanied by domain and ranges	nishant	Download
ArRange	Un robot qui range ma chambre http://drange.zz.mu/world/	tda	Download
Behaim Globe 1492	A visual ontology for the Behaim globe of 1492	goerz	Download
BibFrame	The BIBFRAME Model is a conceptual/practical model that balances the needs of those recording detailed bibliographic description, the needs of those describing other cultural materials, and those who do not require such a detailed level of description. BIBFRAME Initiative is the foundation for the future of bibliographic description that happens on the web and in the networked world. It is designed to integrate with and engage in the wider information community and still serve the very specific needs of libraries.	Bania	Download
Bioinformatics Web Services ontology	The Bioinformatics Web Services ontology (OBWS) is an ontology that extends the Ontology for Biomedical Investigations (OBI) to build an Ontology that supports consistent annotation of Bioinformatics Web services.	jiezhen	Download
BJJ - Brazilian Jiu Jitsu	An Ontology describing the various techniques, positions and related terminology around the Brazilian Jiu Jitsu martial art.	akoscz	Download
Chicken Anatomy		Natasha Noy	Download
CIDOC CRM	The Erlangen CRM/OWL implementation of the CIDOC Conceptual Reference Model	mcharno	Download
Commercial	A commercial ontology focused on business management.	aparedes	Download
Complex Objects	Examples of complex objects using classes from FRBR and predicates from the Fedora relationship ontology	Youn Noh	Download
Computer Gallery	This project was created for study purposes	erginkarakoc	Download
Concepts	Test test test	sergey	Download

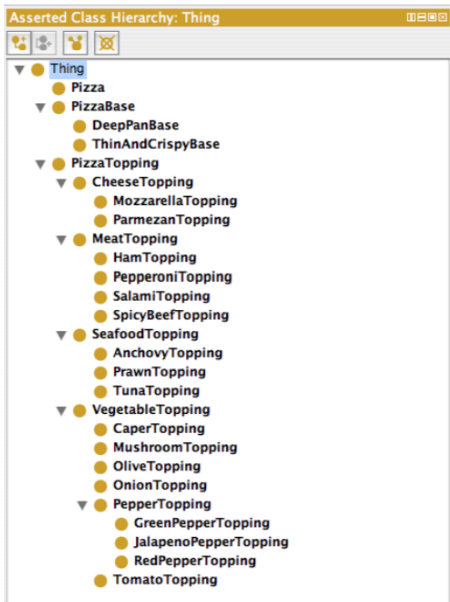
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WebProtégé is developed by the Protégé team in the [Biomedical Informatics Research Group \(BIRG\)](#) at Stanford University, California, USA. The work is supported by Grant GM023316 from the National Institute of General Medical Sciences at the United States National Institute of Health. [Privacy Policy](#) [Terms of Use](#)

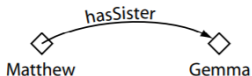
The Class Hierarchy Pane



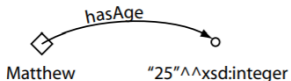
Class Hierarchy



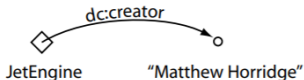
Properties



An object property linking the individual Matthew to the individual Gemma



A datatype property linking the individual Matthew to the data literal '25', which has a type of an xsd:integer.



An annotation property, linking the class 'JetEngine' to the data literal (string) "Matthew Horridge".

Object Properties

The screenshot displays the Protégé interface for editing the `hasBase` property. The top navigation bar includes tabs for `Annotation properties`, `Datatypes`, `Individuals`, `Classes`, `Object properties`, and `Data properties`. The `Object properties` tab is active, showing a tree view of the ontology hierarchy on the left. The `hasBase` property is selected and highlighted in blue.

The main area is divided into several panels:

- Annotations:** A panel titled "Annotations" with a plus sign, currently empty.
- Characteristics:** A list of property characteristics with checkboxes:
 - Functional
 - Inverse function
 - Transitive
 - Symmetric
 - Asymmetric
 - Reflexive
 - Irreflexive
- Description:** A panel titled "Description" showing the property's configuration:
 - Equivalent To:** Empty.
 - SubProperty Of:** `hasIngredient` (with a question mark icon).
 - Inverse Of:** `isBaseOf` (with a question mark icon).
 - Domains (intersection):** `Pizza` (with a question mark icon).
 - Ranges (intersection):** Empty.

At the bottom right, there is a small status bar with the text "To use the reasoner click Reasoner > Start reasoner" and a checked checkbox for "Show Inferences".

Data Properties

The screenshot displays the Protégé ontology editor interface. The top navigation bar includes tabs for 'Annotation properties', 'Datatypes', 'Individuals', 'Classes', 'Object properties', and 'Data properties'. The 'Data properties' tab is active, showing a tree view of the ontology hierarchy on the left. The 'address' property is selected and highlighted in blue. The main workspace is divided into three panes:

- Annotations:** Shows the property's annotations. It includes:
 - `rdfs:comment` [language: en]: An identification of the fixed location of property by means of a structured composition of geographic names and identifiers.
 - `rdfs:isDefinedBy` [type: xsd:anyURI]: <http://inspire.ec.europa.eu/featureconcept/Address>
- Characteristics:** Shows the property's characteristics. The 'Functional' checkbox is currently unchecked. Other characteristics listed include:
 - Equivalent To
 - SubProperty Of
 - Domains (intersection)
 - Ranges
 - Disjoint With

Annotation Properties

The screenshot displays the Protégé interface for editing the 'dc:description' property. The top navigation bar includes 'Annotation properties', 'Datatypes', and 'Individuals'. Below it, 'Classes', 'Object properties', and 'Data properties' are visible. The main window is titled 'Annotations Usage' for 'dc:description' (URI: http://purl.org/dc/elements/1.1/description). On the left, a tree view shows the property hierarchy, with 'dc:description' selected. The right pane shows the 'Annotations' section, which is currently empty, and the 'Domains (intersection)', 'Range (intersection)', and 'Superproperties' sections, each with a plus sign to expand.

Annotation properties Datatypes Individuals

Classes Object properties Data properties

Annotation property hierarchy: dc:description

Annotations Usage

Annotations: dc:description

Annotations +

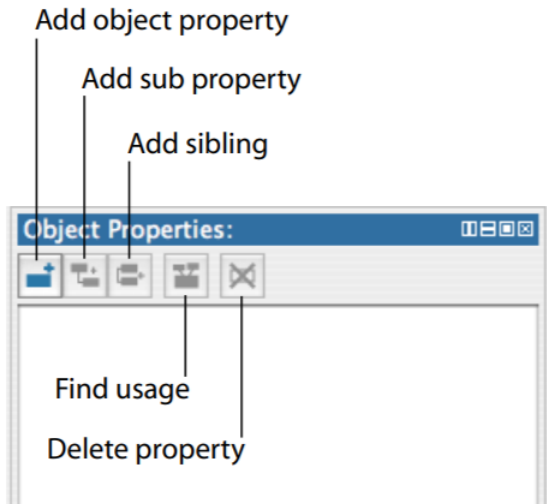
Domains (intersection) +

Range (intersection) +

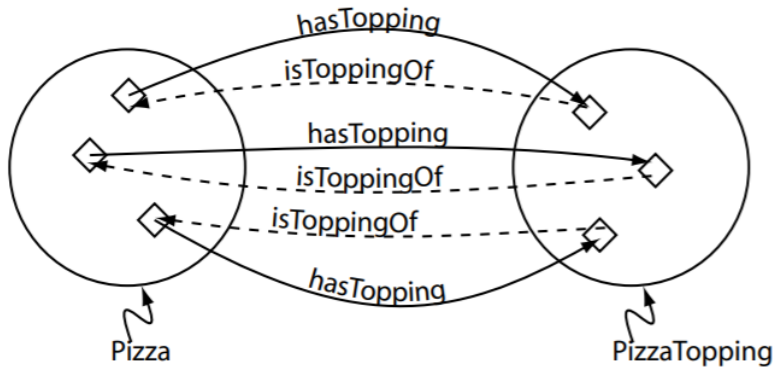
Superproperties +

- dc:description
- dc:title
- dcterms:contributor
- dcterms:license
- dcterms:provenance
- owl:backwardCompatibleWith
- owl:deprecated
- owl:incompatibleWith
- owl:priorVersion
- owl:versionInfo
- rdfs:comment
- rdfs:isDefinedBy
- rdfs:label
- rdfs:seeAlso
- skos:altLabel
- skos:definition
- skos:prefLabel

Property Creation Buttons



Property Domains and Ranges



Inconsistency

The screenshot displays the Protégé interface for the ontology `http://www.co-ode.org/ontologies/pizza/pizza.owl#CheesyVegetableTopping`. The left pane shows the class hierarchy, with `CheesyVegetableTopping` selected. The right pane shows the class's annotations and relationships.

Annotation properties: Classes, Object properties, Datatypes, Individuals, Data properties

Annotations Usage:

- Annotations (+)
- `rdfs:label` [language: en] `CheesyVegetableTopping`
- `rdfs:label` [language: pt] `CoberturaDeQueijoComVegetais`

Descriptors: CheesyVegetableTopping

- Equivalent To (+)
- `owl:Nothing`
- SubClass Of (+)
- `CheeseTopping`
- `VegetableTopping`
- General class axioms (+)
- SubClass Of (Anonymous Ancestor)
- Instances (+)
- Target for Key (+)

References

Exploration of the following references is highly encouraged:-

- [Protégé 5 Documentation](#)
- [Protégé Tutorial \(Manchester\)](#)
- [Protégé Wiki](#)



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