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Original created by Tim Gorichanaz and J. Greenberg (Winter term 2019)

PART 1: WORKING WITH PROTÉGÉ

Protégé is a free, open-source, ontology editor.

Please note Protégé is available in two ways:

- WebProtégé: A web application that you can run from your browser (**We will be working with the Web application/platform in this tutorial.)
- Protégé Desktop: Desktop software that needs to be installed on your computer.

1: Locating WebProtégé

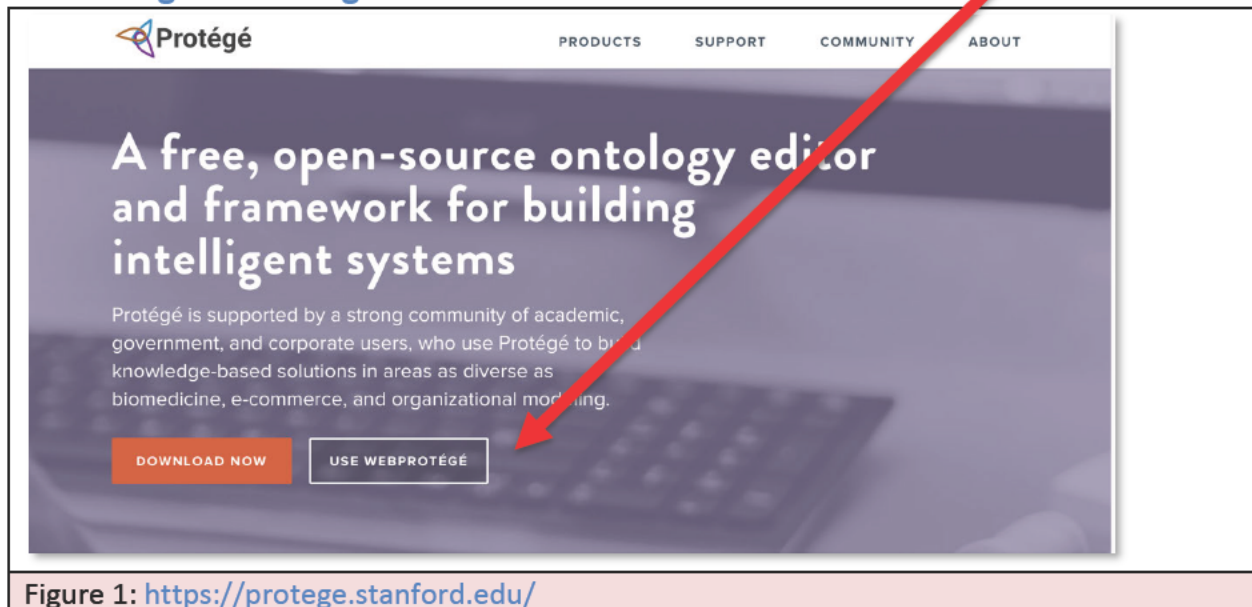


Figure 1: <https://protege.stanford.edu/>

Protégé provides a convenient way to deal with the technical and visual aspects of making an ontology. It's important to emphasize that working with and building the ontology comes after you have thought through the ontology. If you can't yet sketch out your ontology on paper, you're not ready to go into Protégé. Said another way, before you launch your own Protégé project, **make sure you've thought through the different classes/subclasses, properties**, etc., in your ontology.

2. Getting Started with WebProtégé

To get started with Protégé, go to: <http://webprotege.stanford.edu> with WebProtégé . You will see a login screen.

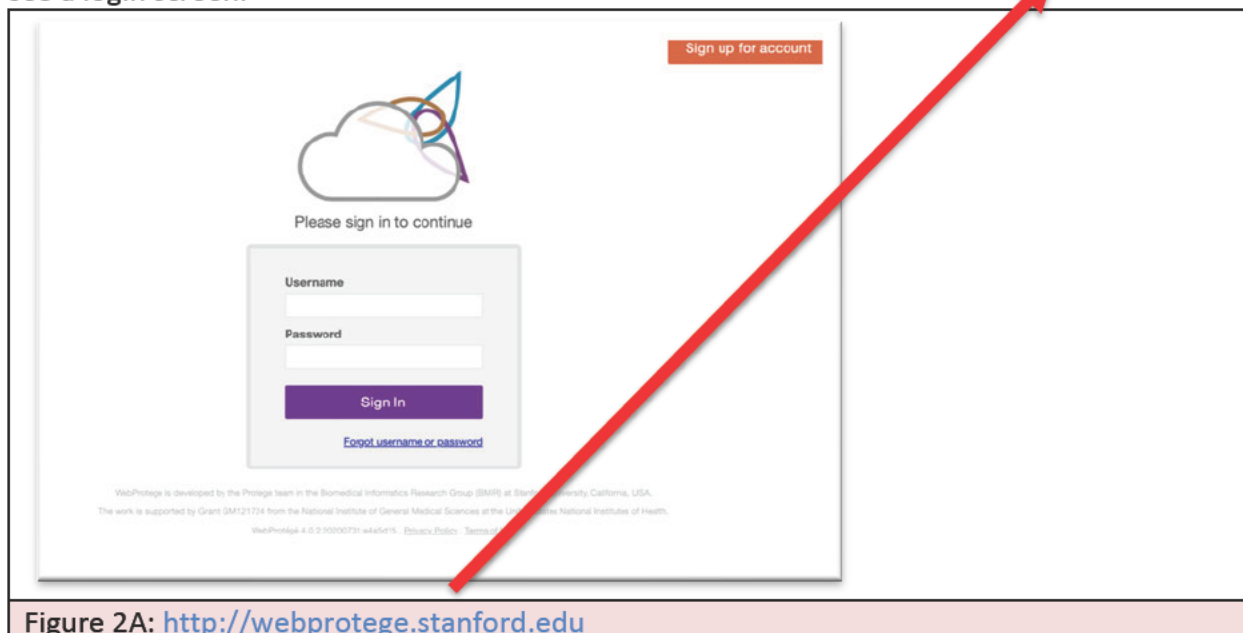


Figure 2A: <http://webprotege.stanford.edu>

At the top right, click **Sign up for an account**. Fill out the form and then click Create Account. You should get a message saying *Registration complete*.

Now you can sign in. Enter your username and password and click **Sign in**. You will see something like this:

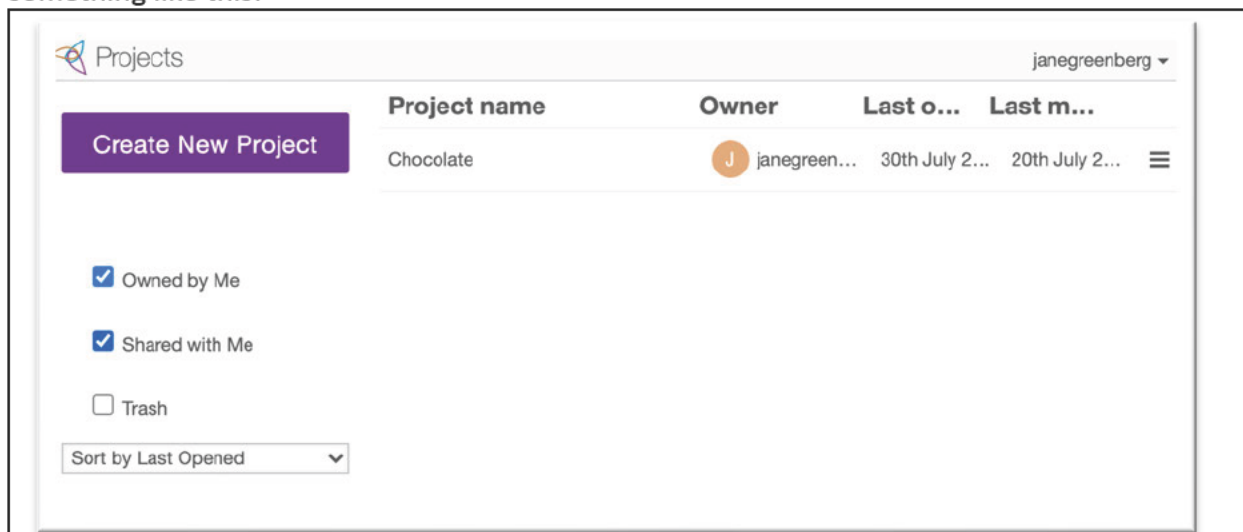


Figure 2B: <https://webprotege.stanford.edu/#projects/list>

You are signed-in!

3. Creating a New Project

Click the *Create New Project* button at the upper left (Figure 2A above, PURPLE BUTTON). Give it whatever name you like and a description. (Note, for future reference, you can upload a file if you already have something started.) Click the ≡ symbol at the righthand side and select *Open* (Figure 2B above), far right-hand side).

You will then come to a screen like the one shown below, Figure 3.



Figure 3: Input Screen –A blank project template

4. Establishing ontology terms (semantic concepts)

See the upper-leftmost section of the window, under Class Hierarchy. There are options to Create, Delete, and Search.

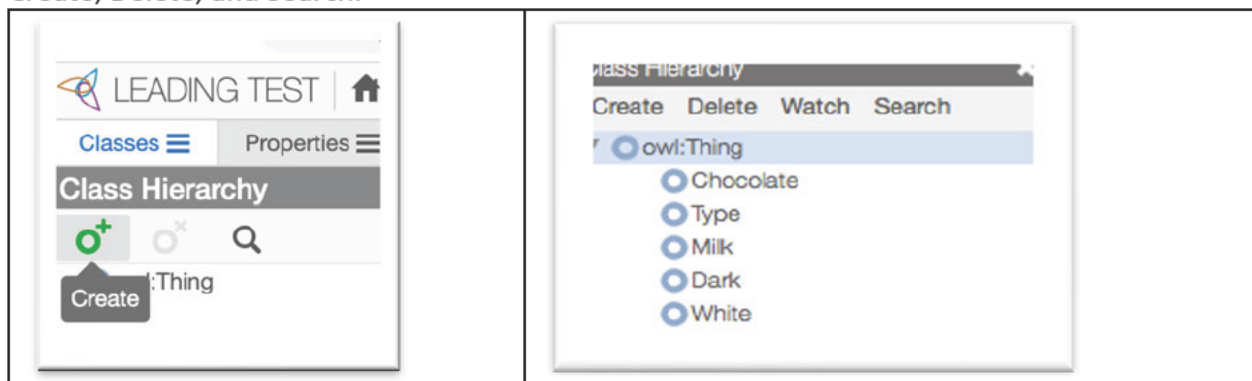


Figure 4A and Figure 4B: [Adding terms to Protégé](#)

Click **Create** to create a class. A window will pop up where you can type in the classes (terms) you would like to add and select the create button. (Note: You may also type multiple terms in at once, hitting enter after each term). **Type the following words, each in as a new entry: Chocolate, Type, Milk, Dark, White**, move to step 5 to establish your hierarchies.

5. Establishing hierarchies

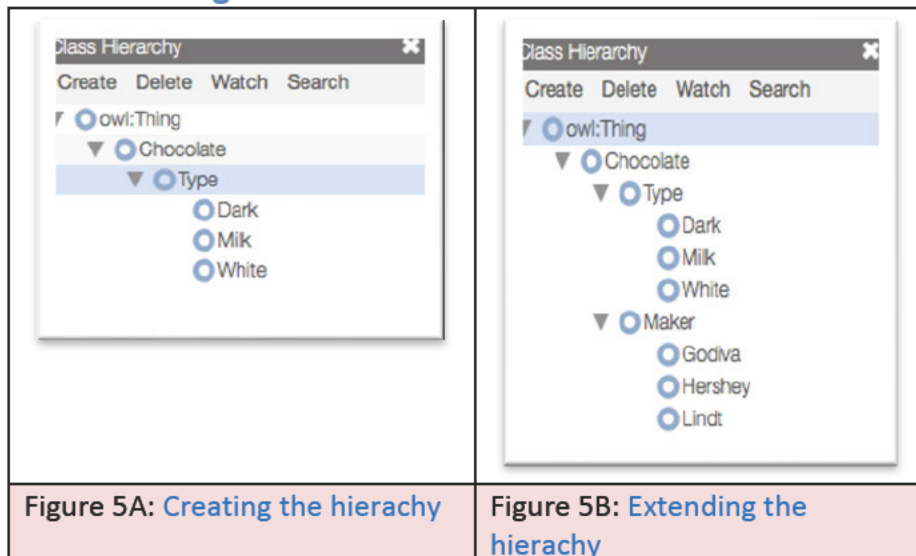



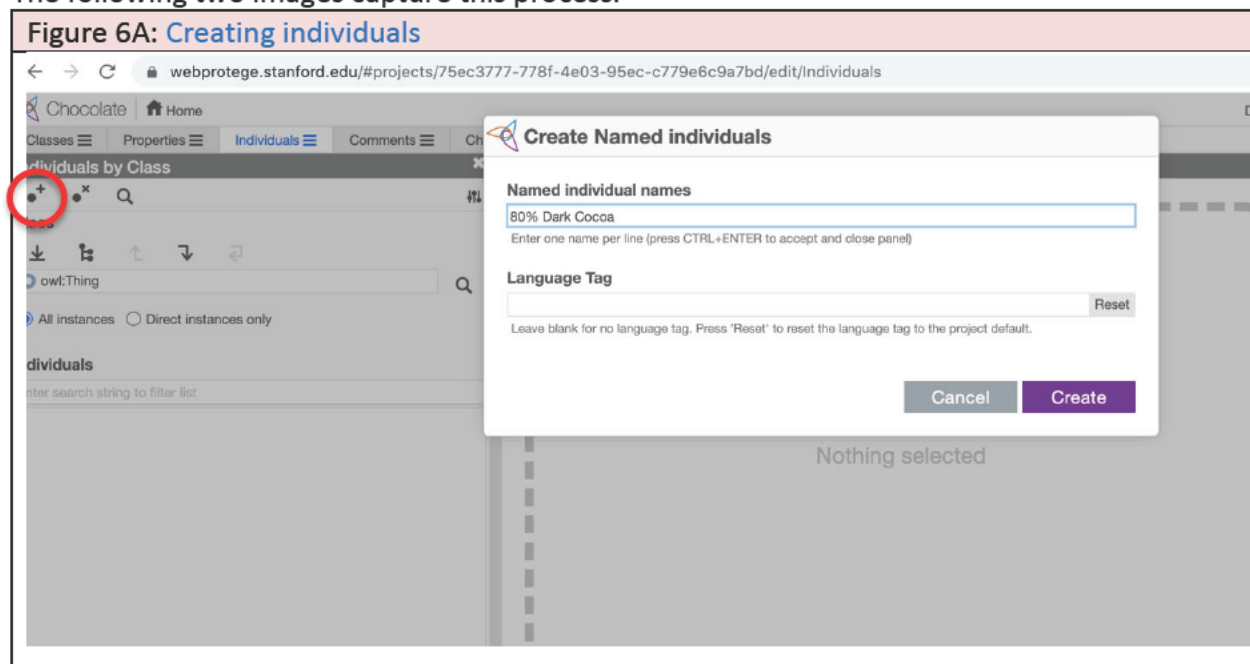
Figure 5A: [Creating the hierarchy](#)

Figure 5B: [Extending the hierarchy](#)

Establishing hierarchies can be done by dragging and dropping. **Drag Milk onto Type**. You'll see that Milk moves to be indented below Type. **You may do the same for Dark and White. Then, drag Type onto Chocolate**. Note that you can click the  to expand and contract a class. Now your hierarchy should look like Figure 5B. Notice, 5B also has a hierarchy for Maker. This was created the same way.

6. Creating individuals and establishing relationships

We want to have some individuals in our ontology. On the left-hand side, find the section that says **Individuals by Class**. Click **Create**. Type in: **80% Dark Cocoa**. Then click the **Create** button. The following two images capture this process.



This individual is made by Lindt, and we can specify that there is a relationship between an individual and a Maker.

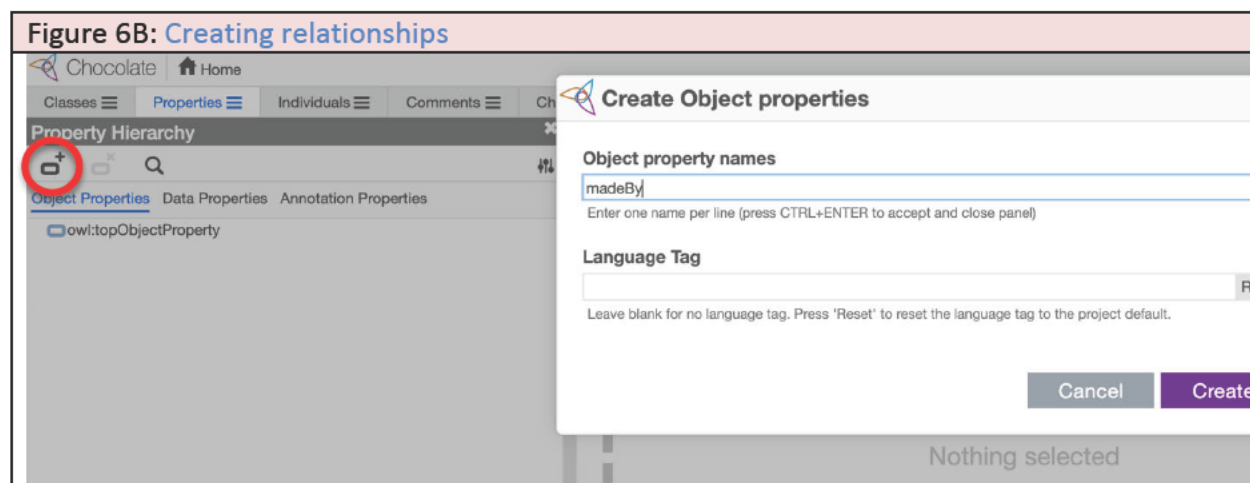


Figure 6C: Establishing relationships

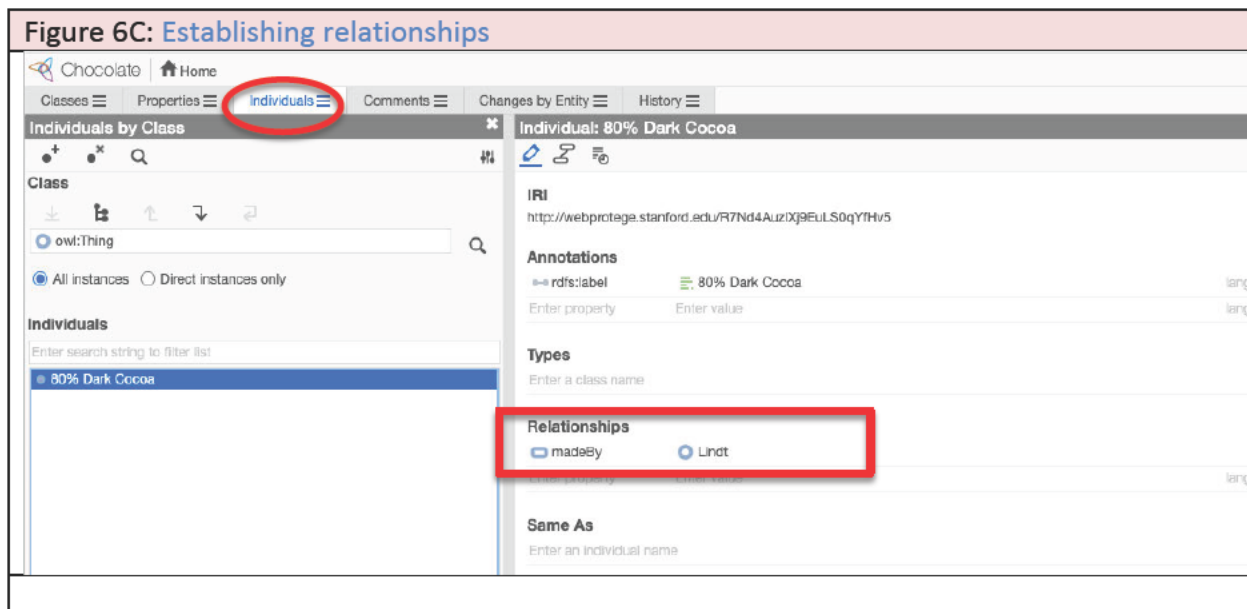
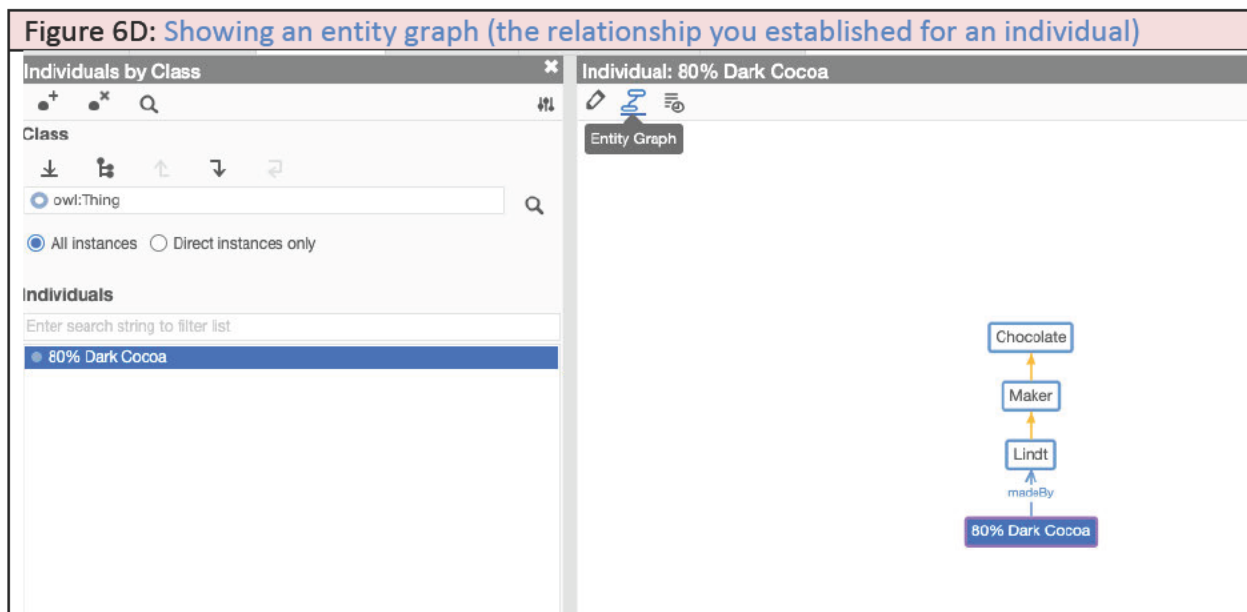


Figure 6D: Showing an entity graph (the relationship you established for an individual)



3. Working with WebVOWL

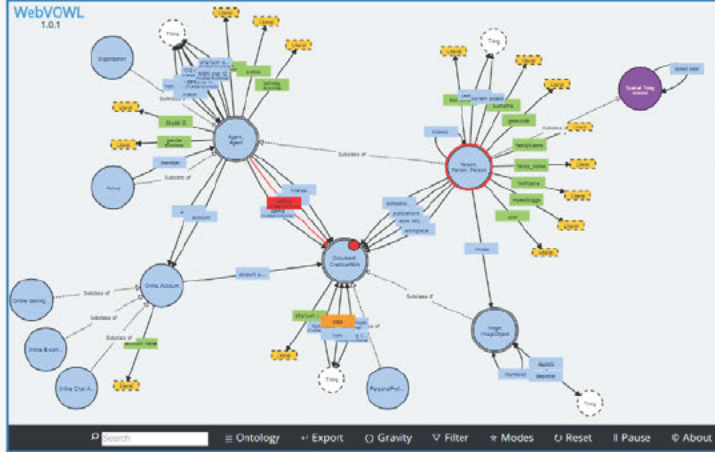
You may access WebVOWL at: <http://vowl.visualdataweb.org/webvowl.html>

Figure 3A: WebVOWL access to the Web Application

Run WebVOWL »

Old WebVOWL version (beta 0.5.2) as fallback

Note that WebVOWL is able to visualize most language constructs of OWL 2 but not all of them (and also not all combinations). For instance, complex datatypes and some instance level constructs are not supported by WebVOWL at the moment.



Friend of a Friend (FOAF) vocabulary

<http://xmlns.com/foaf/0.1/>

Version: -
Author(s): -
Language: **unlabeled**

► Description

► Metadata

► Statistics


▼ Selection Details

Name: **Person**
Type: **owl:equivalentClass**
Equivalent to: **Person, Person**
Disjoint: **Project, Organization**
Characteristics: **equivalent**
Comment: **A person.**
rdfs:label: **A person.**
term:status: **stable**

****NOTE**

- Preferred: OldWebVOWL beta 0.5.2 (right-hand side). This is a solid stand-by that many people use daily.
- You may absolutely try "Run WebVOWL" (left-hand side), and if it works great, if the system hangs on for too long, please use, OldWebOWL

Figure 3B: Ontology upload option

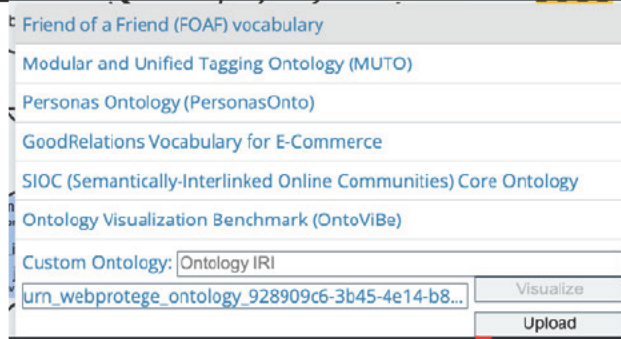


vowl-old.html#

Ontology Export Gravity Filter

You may explore the ontologies already available. To make a visualization, click "Please select a file."

Figure 3C: Uploading your ontology



Friend of a Friend (FOAF) vocabulary

Modular and Unified Tagging Ontology (MUTO)

Personas Ontology (PersonasOnto)

GoodRelations Vocabulary for E-Commerce

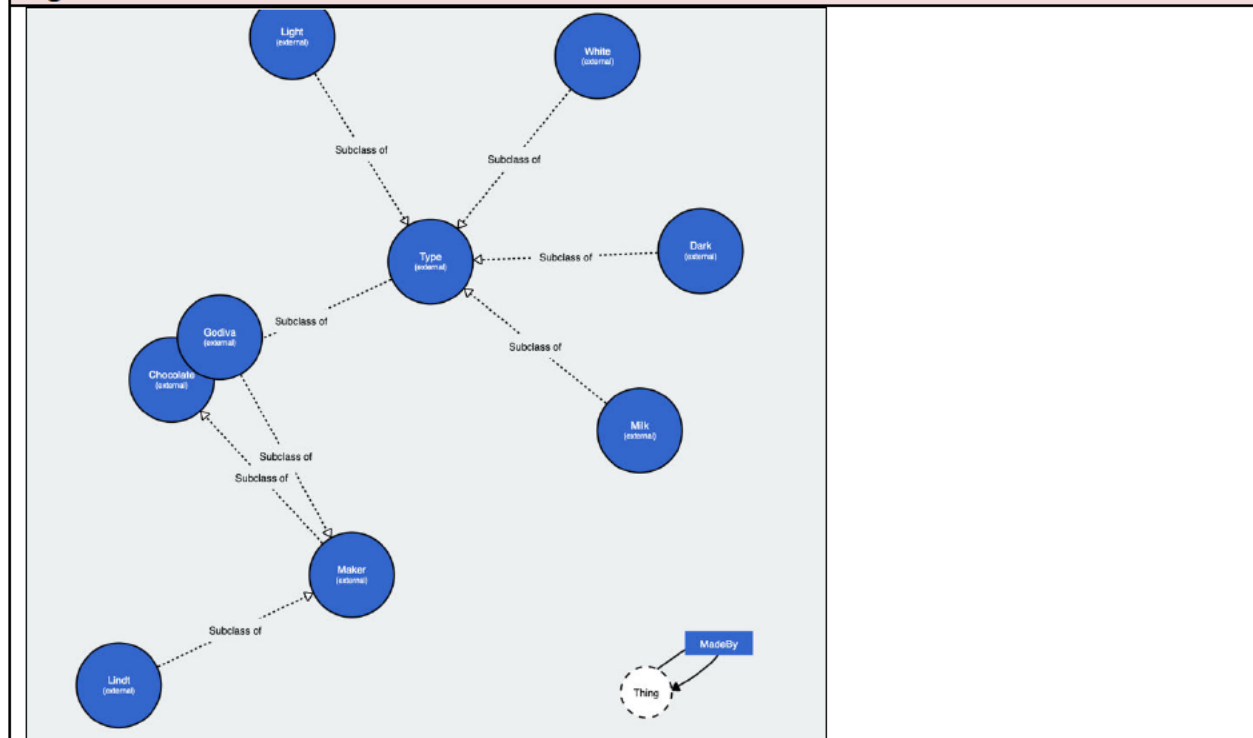
SIOC (Semantically-Interlinked Online Communities) Core Ontology

Ontology Visualization Benchmark (OntoViBe)

Custom Ontology:

Remember to click upload, then you will get the visualization found in figure 14

Figure 3D: WebVOWL Visualization



Your WebVOWL Visualization.

4. Working with the RDF Validator

You may also play explore the W3C RDF Validator: <https://www.w3.org/RDF/Validator/> , which allows you to parse your ontology and generate a graph

Figure 4A: RDF Validator

Check and Visualize your RDF documents

[olde servlet](#)

Enter a URI or paste an RDF/XML document into the text field above. A 3-tuple (triple) representation of the corresponding data model as well as an optional graphical visualization of the data model will be displayed.

Check by Direct Input

```
<?xml version="1.0"?>
<rdf:RDF xmlns="urn:webprotege:ontology:928909c6-3b45-4e14-b869-
b4ae47c22770#"
  xml:base="urn:webprotege:ontology:928909c6-3b45-4e14-b869-
b4ae47c22770"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:xm1="http://www.w3.org/XML/1998/namespace"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
```

Parse RDF Restore the original example Clear the textarea

Display Result Options:

Triples and/or Graph ☒ Triples Only

Graph format: PNG

☒ Triples and Graph

☐ Graph Only

Paste an RDF/XML document into the following text field to have it checked. More options are available in the [Extended interface](#).

Check by URI

Follow these four steps

- 1) Erase the text/metadata that is in the current box.
- 2) Copy and paste in your entire RDF/XML ontology
- 3) Select Triple and Graph Option
- 4) Select "Parse RDF"

Results shown in Figures 7B and 7C

Figure 4B: RDF Validation

Number	Subject	Predicate	Object
1	urn:webprotege:ontology:928909c6-3b45-4e14-b869-b4ae47c22770	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/2002/07/owl#Ontology
2	http://webprotege.stanford.edu/89mT1U0c0mThMitj6oiNh0B	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/2002/07/owl#ObjectProperty
3	http://webprotege.stanford.edu/89mT1U0c0mThMitj6oiNh0B	http://www.w3.org/2000/01/rdf-schema#label	"MadeBy"
4	http://webprotege.stanford.edu/87J8i0tN6j3RnKH14zcHfN0	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/2002/07/owl#Class
5	http://webprotege.stanford.edu/87J8i0tN6j3RnKH14zcHfN0	http://www.w3.org/2000/01/rdf-schema#subClassOf	http://webprotege.stanford.edu/8xcnM56jWm9z8Vv
6	http://webprotege.stanford.edu/87J8i0tN6j3RnKH14zcHfN0	http://www.w3.org/2000/01/rdf-schema#label	"Lindt"
7	http://webprotege.stanford.edu/87yukK8magbychD7taBSErC	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/2002/07/owl#Class
8	http://webprotege.stanford.edu/87yukK8magbychD7taBSErC	http://www.w3.org/2000/01/rdf-schema#subClassOf	http://webprotege.stanford.edu/8of4YcfuWu2PnIb
9	http://webprotege.stanford.edu/87yukK8magbychD7taBSErC	http://www.w3.org/2000/01/rdf-schema#label	"Light"
10	http://webprotege.stanford.edu/88IXi07dX1508cLU271gCc	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/2002/07/owl#Class
11	http://webprotege.stanford.edu/88IXi07dX1508cLU271gCc	http://www.w3.org/2000/01/rdf-schema#subClassOf	http://webprotege.stanford.edu/8of4YcfuWu2PnIb
12	http://webprotege.stanford.edu/88IXi07dX1508cLU271gCc	http://www.w3.org/2000/01/rdf-schema#label	"White"

Figure 4C: RDF Graph (snippet)

