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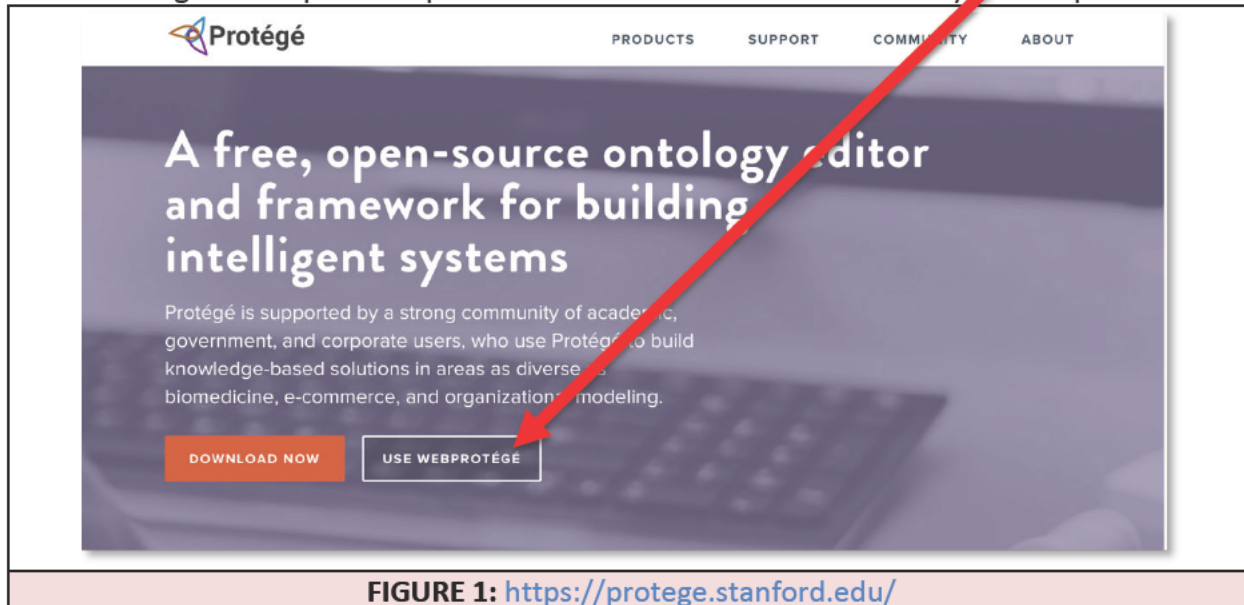
Created by: Tim Gorichanaz and J. Greenberg (January 2019, updates: Summer 2021, Winter 2022, Summer 2022)

1. Overview

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.

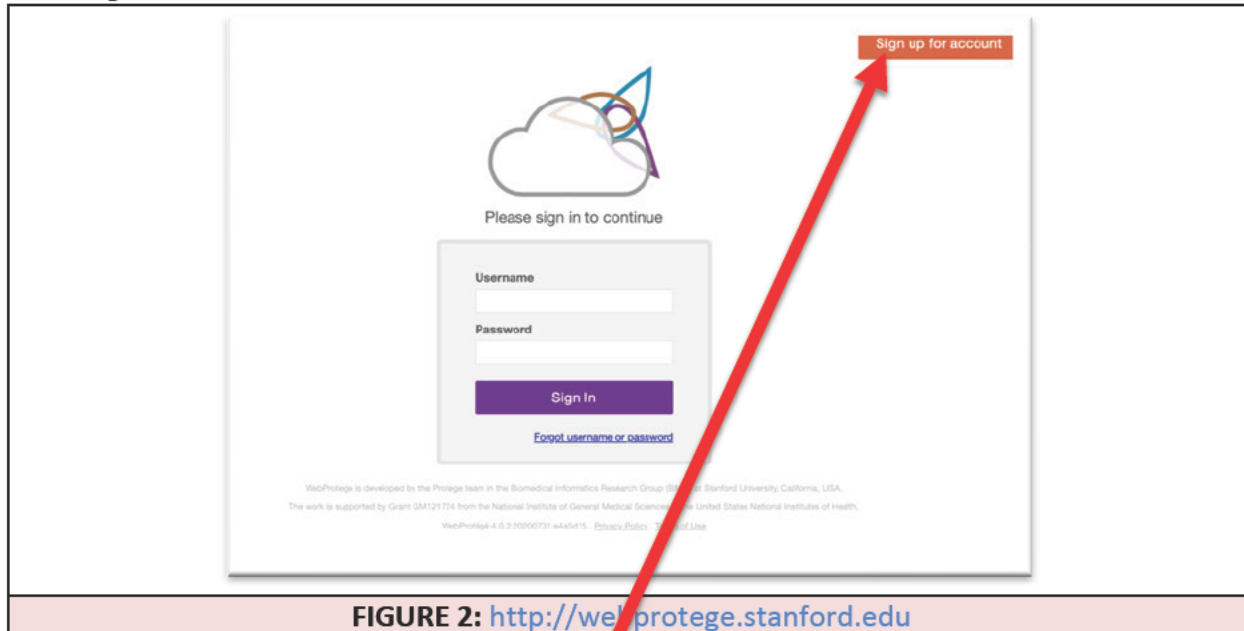


For LEADING, we will be working with the Web application so you may start to see the basic functions of the software.

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.

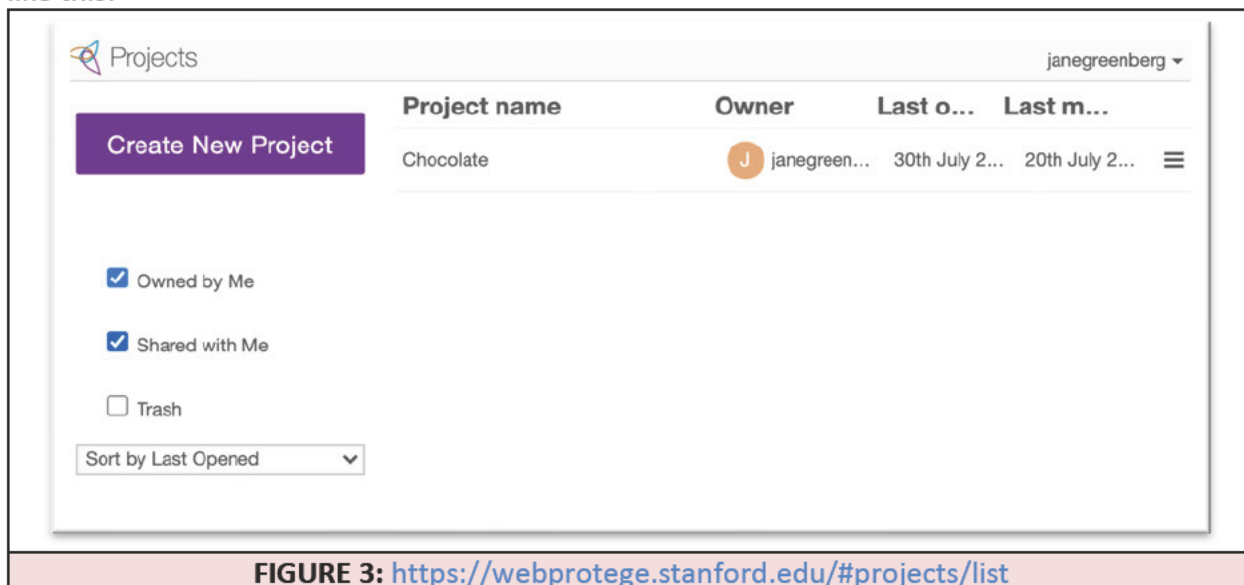
2. Getting Started with WebProtégé

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



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:



You are signed-in!

3. Creating a New Project

Click the *Create New Project* button at the upper left (FIGURE 3, 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.

The project you created will now appear in the list. On this page.

Click the ≡ symbol at the righthand side and select *Open* (FIGURE 3, far right-hand side)).

You will then come to a screen like the one shown below, FIGURE 4.

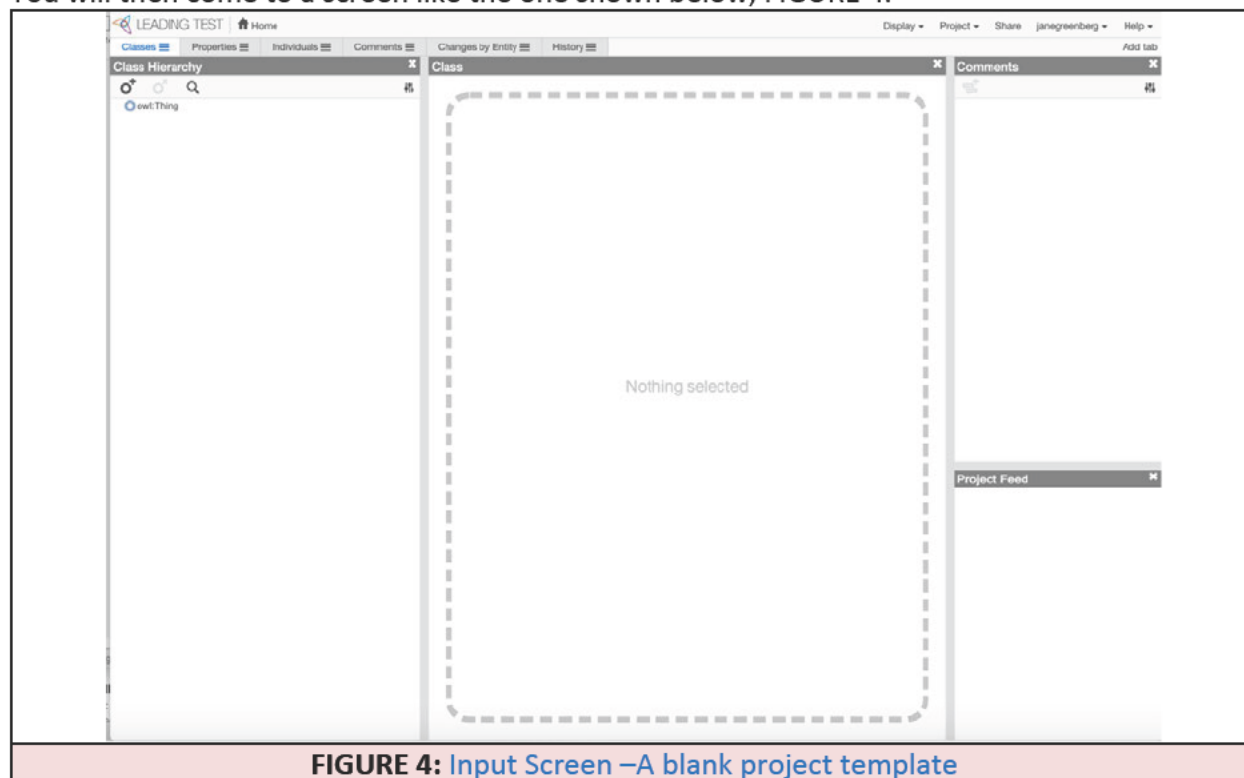


FIGURE 4: Input Screen –A blank project template

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.

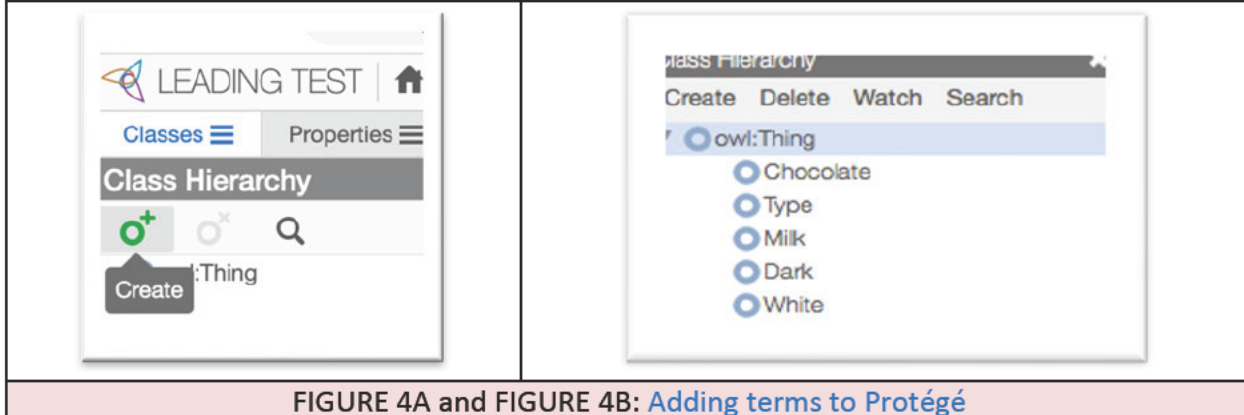


FIGURE 4A and FIGURE 4B: Adding terms to Protégé

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. Then the words you typed will appear under Class Hierarchy, as pictured below Figure 5.

5. Establishing the hierarchy

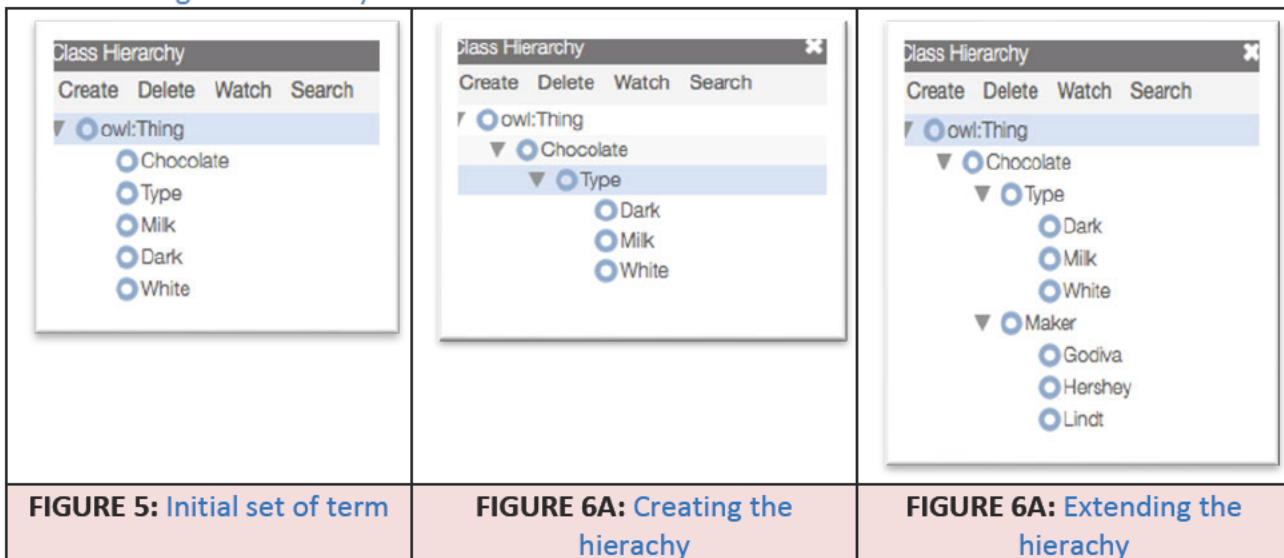



FIGURE 5: Initial set of term

FIGURE 6A: Creating the hierarchy

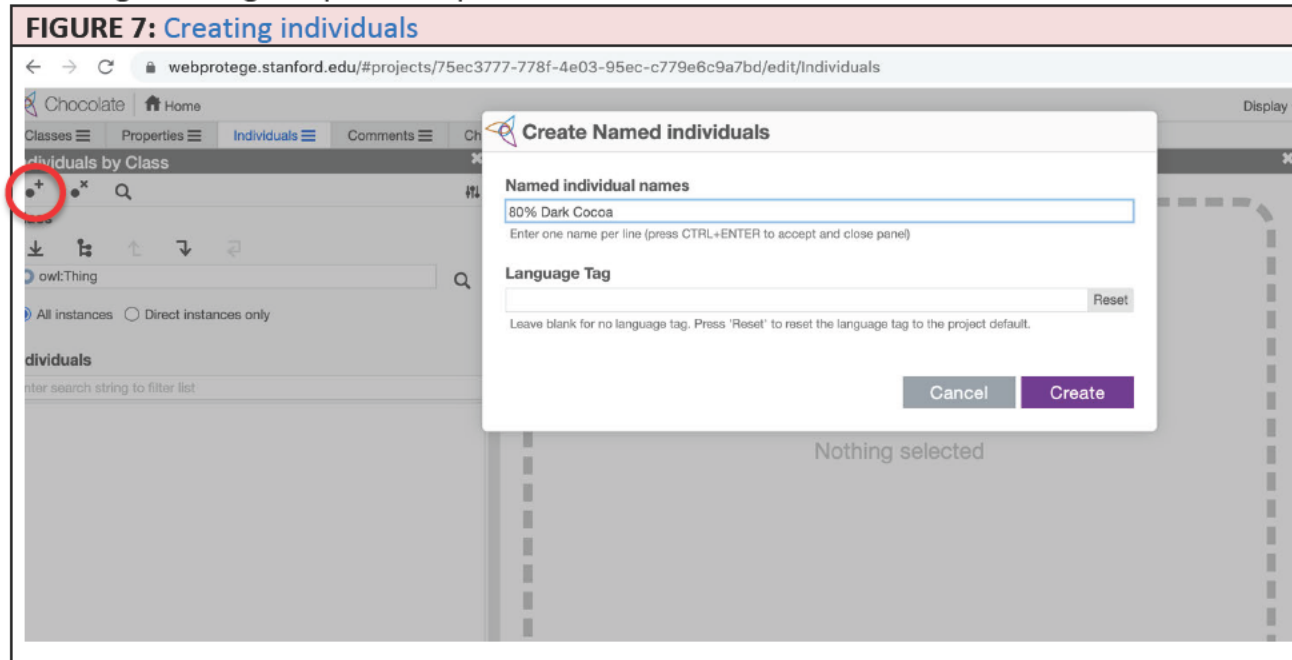
FIGURE 6B: Extending the hierarchy

You'll notice that all the terms are at the same level of indentation (Figure 5). However, we want Milk, Dark and White to be under Type, which in turn should be under Chocolate. Making this change is just a matter of dragging and dropping. **Drag Milk onto Type.** You'll see that Milk moves to be indented below Type. **Now 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 6A.

Let's also create a class for Maker. Just as before, click Create, and try to make a hierarchy as shown in Figure 6B.

5. 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.

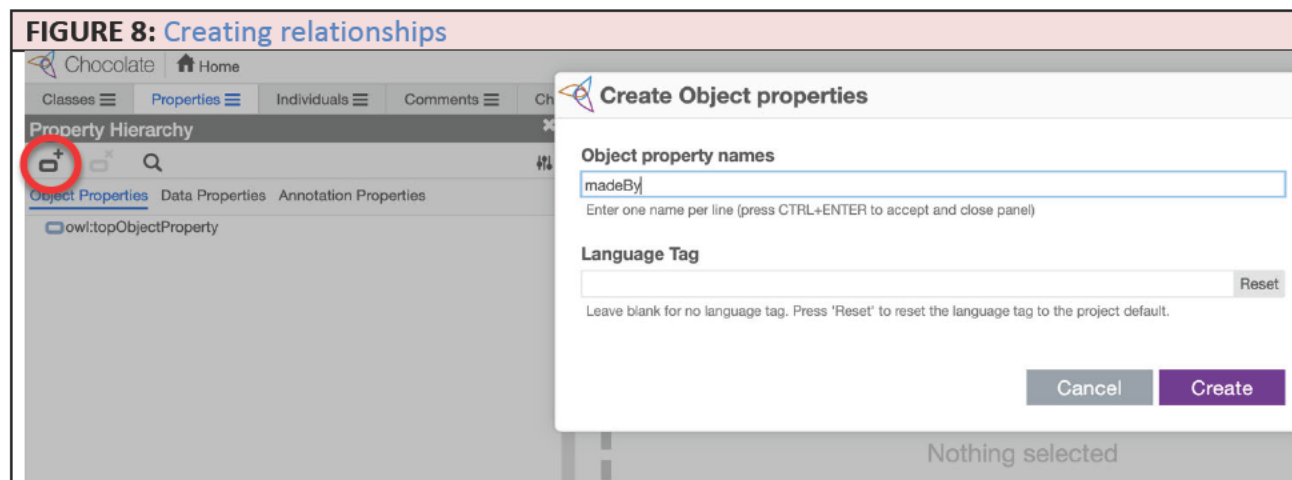
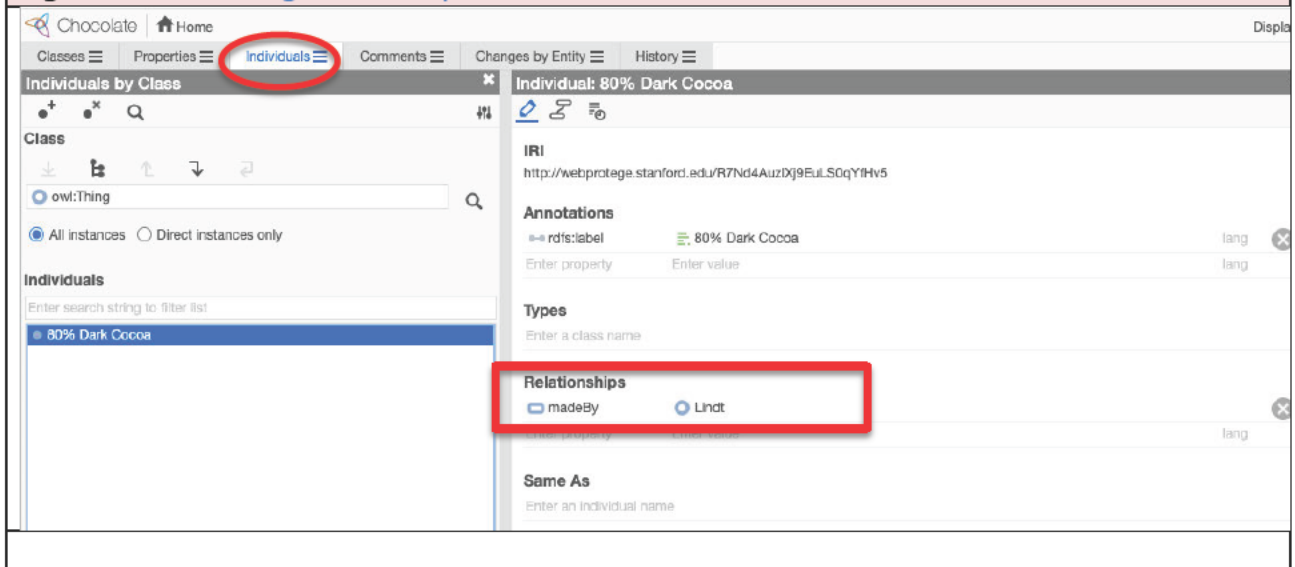
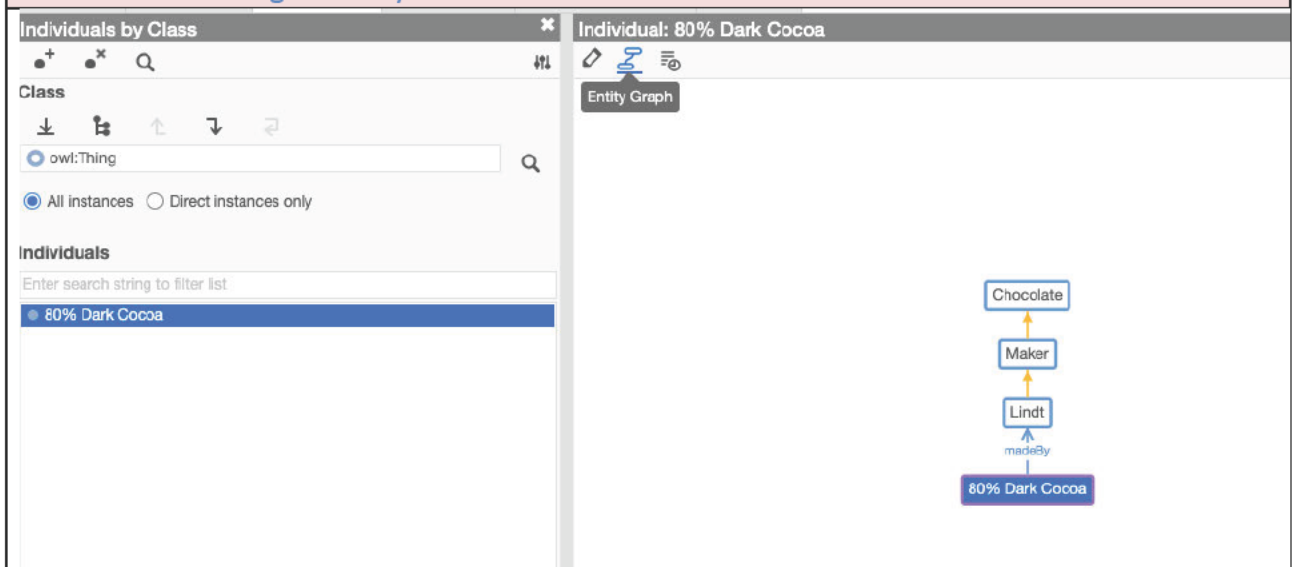
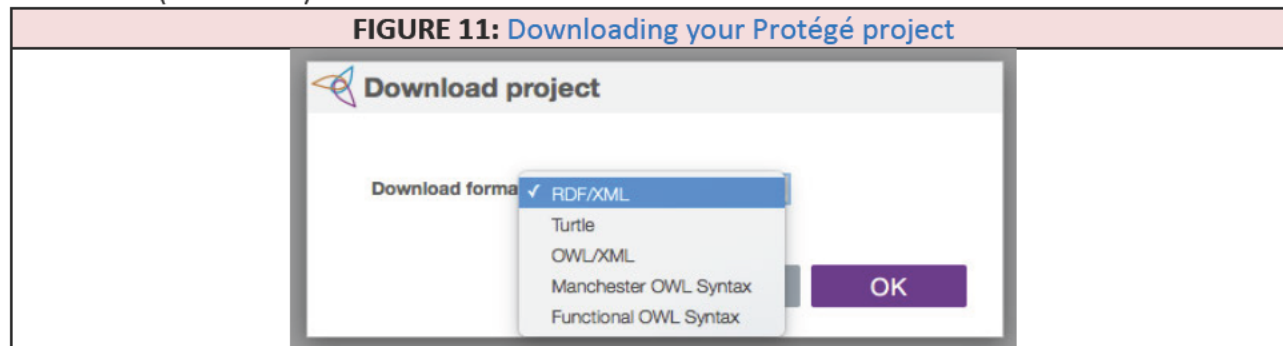


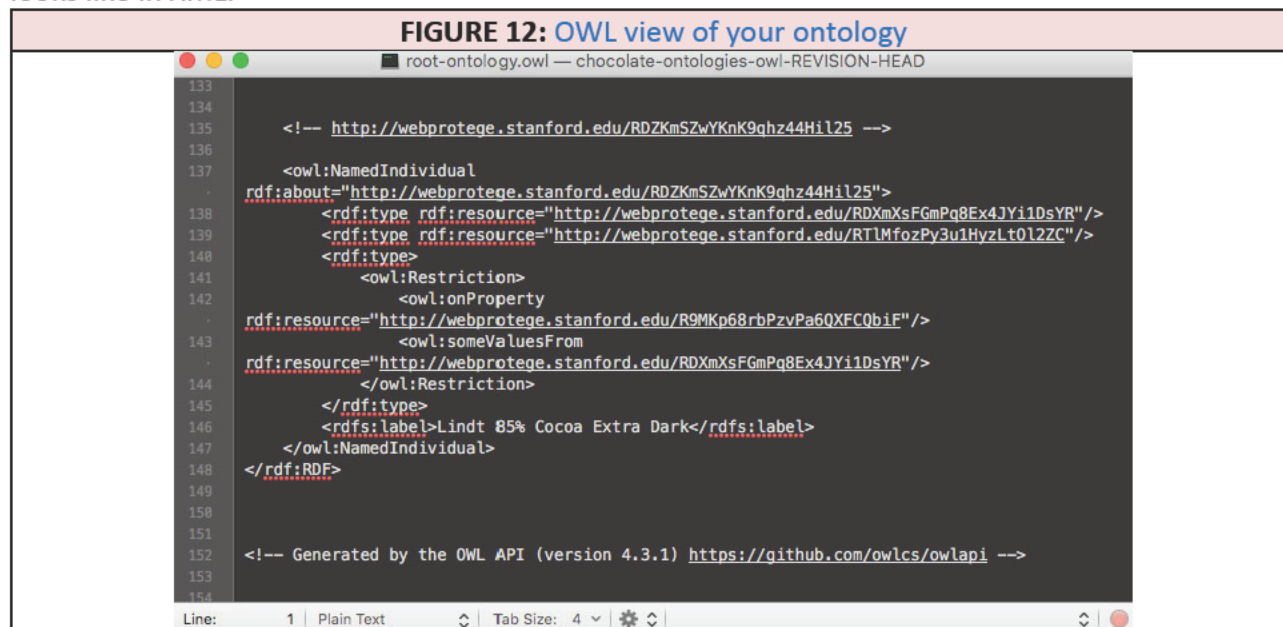
Figure 9: Establishing relationships**FIGURE 10: Showing an entity**

6. Downloading and playing with/visualizing your ontology

When you are done making an ontology, you may download Protégé for operation in any information system you're using. To do that, first click **Home** at the top left of the screen. Now, to the right of the project you want, click the \equiv symbol and select **Download**. You will be presented with some options. In this class, you'll turn in an ontology in RDF/XML format, so select that (FIGURE 10)



A zip file will download, and if you extract that, you'll get a .owl file that you can open. To see what it looks like, open it in a plain text editor. The image below shows what the individual we created looks like in XML.



That may not be very interesting, and it's hard to visualize the ontology's structure.

7. Optional activities

You may also play with one or both of RDF graph outputs:

- WebVOWL: <https://service.tib.eu/webvowl/> and <https://service.tib.eu/webvowl/>
-
- W3C RDF Validator: <https://www.w3.org/RDF/Validator/>