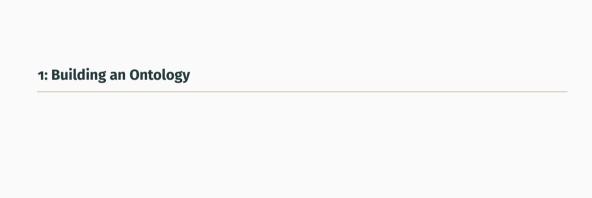
Semantic Web - Tutorial #7

Isabelle Kuhlmann

Institute for Web Science & Technologies University of Koblenz-Landau

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1: Building an Ontology

Main Task

Create an ontology in the domain of the Harry Potter Universe.

You can get some useful information at https://en.wikipedia.org/wiki/Harry_Potter and https://harrypotter.fandom.com/wiki/Main_Page. Keep in mind the steps required to design an ontology.



Task:

- ► Go through all the steps of ontology engineering, following the methodology presented in the lecture.
- ▶ Document steps 1–3 by outlining the respective results.
- Design an appropriate ontology defining at least 4 concepts, their (possible) hierarchy, properties and relationships. Specify the ontology in OWL and submit the file.

We will use the tool *Protégé*¹ throughout the course of this tutorial.

¹http://protege.stanford.edu



Step 1: Determine the domain and scope of the ontology

- ► What is the domain?
 - ► Harry Potter universe
 - ► For example: places, creatures, groups, magical objects, spells
- ► For what are we going to use the ontology?
 - ▶ To model the Harry Potter franchise and cross information about the story and characters.
- ► For what types of questions should the information in the ontology provide answers?
 - ► Which kinds of spells exist?
 - ► What is the relationship between charms and curses?
 - ► Who owns the Marauder's Map?
 - ► Who lives in Little Whinging?
- Who will use and maintain the ontology?
 - We do not have this information.



Step 2: Consider reusing existing ontologies (or parts of them)

- ► We can use this ontology which includes a number of Harry Potter characters: https://github.com/lomcin/harrypottontology
- ► However, we should not use existing ontologies about plant or animal domains, as they fall outside of our scope and might just add a lot of redundant information.



Step 3: Enumerate important terms in the ontology

- ► Terms we would like to talk about:
 - "Classes" of characters, such as muggles, wizards/witches, squibs, etc.
 - ► Creatures, for example: phoenix, hippogriff, dragon, gnome
 - ► Places, for example: schools (like Hogwarts or Durmstrang), towns (like Hogsmeade or Godric's Hollow), public places of the magical world (like Diagon Alley or The Leaky Cauldron)
 - Magical objects, such as horcruxes, the Marauder's Map, Quidditch balls, the Time-Turner, and Wizard's Chess equipment
 - School subjects, like potions or charms
 - ► Spells, like Alohomora or Lumos
- ► Which are the properties that connect those terms, and what would you like to say about these terms?
 - A subject is taught at a school
 - ► Wizards and witches can cast spells
 - ► A magical object *belongs to* a wizard/witch.
 - ▶ Both living things (i.e., persons and creatures) and places can have names.



1: Building an Ontology | Examples of Concepts

Examples of concepts we could model:

- ► A person lives at a place.
- ► A spell is cast by a magical person.
- ► A magical object can be owned by a magical person.
- ► A magical school subject is taught at a magical school.



1: Building an Ontology | Instantiation

Task: Specify at least 8 statements with instances for your ontology. You must cover all the elements on your ontology: concepts, properties, relationships.

```
@prefix onto: <http://www.semanticweb.org/isabelle/ontologies/</pre>
           2021/5/harry-potter-ontology>.
2:
  @prefix wiki: <https://harrypotter.fandom.com/wiki/>
  @prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
5:
   wiki: Hogwarts_School_of_Witchcraft_and_Wizardry
           rdf:type onto:MagicalSchool.
7:
8:
  wiki:Leaky_Cauldron
                           rdf:type onto:MagicalPlace;
                           onto:locatedAt wiki:London.
10:
11:
   wiki:Defence_Against_the_Dark_Arts
           rdf:type onto:MagicalSchoolSubject;
13:
           onto:taughtAt wiki:Hogwarts_School_of_Witchcraft_and_Wizardry.
14:
```



1: Building an Ontology | Instantiation

```
wiki: Marauders_Map
                              rdf:type
                                                onto:MagicalObject;
                              onto:ownedBy
                                                wiki: Harry_Potter.
16:
17:
   wiki:Patronus_Charm
                              rdf:type
                                                onto:Charm;
                              onto:castBy
                                                wiki: Harry_Potter;
19:
                              onto:castBy
                                                wiki:Remus_Lupin.
20:
211
   wiki:Buckbeak
                     rdf:tvpe
                                   onto: Magical Creature.
23:
   wiki:Hermione_Granger
                              rdf:tvpe
                                            onto: Magical Person.
25:
   wiki:Diagon_Alley
                         rdf:tvpe
                                                onto: Magical Place;
                          onto:locatedAt
                                                wiki:London:
27:
                          onto:locatedNear
                                                wiki:Knockturn_Alley.
28:
```



1: Building an Ontology | Document the Ontology

Task:

- Make use of annotations (e.g., rdf:comment) for documenting each element (concept, property, relationship) comprehensibly. Add them to your OWL file.
- ► Create and submit a HTML documentation for the ontology (based on annotations). Make use of tools such as Protégé, WebProtégé, Parrot² or LODE³

³http://www.essepuntato.it/lode



²http://ontorule-project.eu/parrot/parrot