**Exercise 1 Modelling Terminological Knowledge** (5 Points)

Model terminological knowledge from a domain of your choice (family relationships, sports, public life, economy, social networks, . . . ) in description logic, using general concept inclusions. Example: PopularGuy ⊑ ∀hasFriend. PopularGuy.   
  
**Concepts**  
  
Person  
Author  
Book  
Library  
Genre  
Publisher

Author ⊑ Person

**Roles**

has Author  
hasGenre  
publishedBy  
contains

**Individuals**

Amelia  
Lyla  
Henry  
JKRowling  
JRRTolkien  
TheHobbit  
Harry\_Potter\_and\_the\_order\_of\_the\_Fenix  
Fantasy  
Drama

hasAuthor(TheHobbit , JRRTolkien)  
hasGenre(Harry\_Potter\_and\_the\_order\_of\_the\_Fenix, Fantasy)

**Axioms**

Book ⊑ ∃hasAuthor.Author  
“Set of individuals that are Books have at least one Author”.  
  
Library ⊑ ∃.contains.Book  
“Set of individuals that are Library have at least one Book”.  
  
Book ⊑ ∀hasAuthor.Persona  
“Every book is associated with authors, and these authors are people.”  
  
∃hasAuthor.⊤ ⊑ Book  
“Domain of hasAuthor is a set of Books”.  
  
⊤ ⊑ ∀hasAuthor.Author  
“The Range of hasAuthor is a set of Author”.

**Notions that can not be modelled**(a) Library ⊑ ∃.contains.Author.  
It does not have sense for a library to contain an author directly.  
A library contains books, and author are associated with books. This type of notion inclusion would be incorrect.  
  
  
(b) has Author ⊑ T  
Is not true that everything is related with authors, only Books and Author in this example.

**For which notions can one make do with acyclic terminologies?**

In the example of the Library, the axioms provided acyclic relationships.  
Each notion and its relationships form a directed acyclic graph.

**Exercise 2 Tool Use** (4 Points)

Install the Protege ontology editor and use it to write down your example ontology in OWL. This requires independent acquisition of the syntax used in the tool, which deviates from the one used in the lecture. Experiment with reasoners (available as plugins), and report on the results of example queries.

**Ontology Metrics in Protégé**  
A screenshot of a math test

Description automatically generated

**Reasoner**  
A screenshot of a computer

Description automatically generated