Super-pattern Formalization Study Instructions

With this study, we want to evaluate our approach for formally representing high-level scientific claims in RDF. An example of such a high-level claim taken from an actual paper is the following:

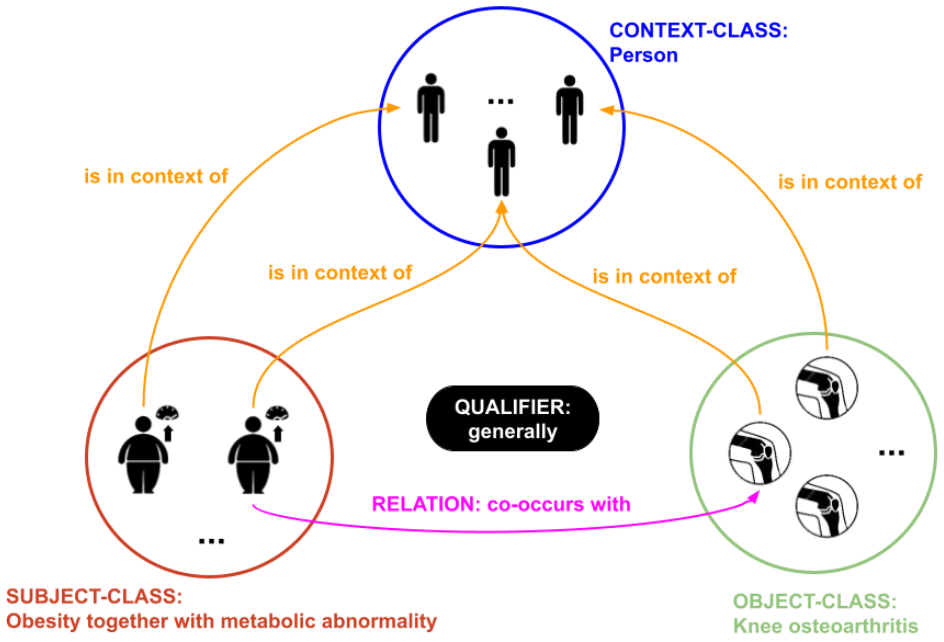
> **Obesity when accompanied by metabolic abnormality is closely associated with knee osteoarthritis.**

(Side note: To be able to treat such informal claims in a general way, we are using the scheme of AIDA sentences, which are basically just English sentences that are Atomic, Independent, Declarative, and Absolute. The absoluteness property means that we are excluding information about how the claim was derived and how certain we can be about its truth.)

Our approach to formalize such informal claims is based on a "super-pattern", which for the example above would be instantiated as follows:

CONTEXT-CLASS ("in the context of all ..."):	**Person**
SUBJECT-CLASS ("things of type ..."):	**Obesity together with metabolic abnormality**
QUALIFIER:	**generally**
RELATION-TYPE ("have a relation of type..."):	**co-occurs with**
OBJECT-CLASS ("to things of type..."):	**Knee osteoarthritis**

To instantiate this super-pattern, a context class, a subject class, a qualifier, a relation and an object class have to be given. The diagram below illustrates how the super-pattern is to be interpreted, showing the same example:



Formally, therefore, this super-pattern instance is stating that for all things of type “obesity together with metabolic abnormality” that are in the context of a thing of type “person” there is “generally” (defined as: in at least 90% of the cases) a thing of type “knee osteoarthritis” that is in the same context such that there is a relation of type “co-occurs with” of the thing in the subject class (here “obesity together with metabolic abnormality”) to the thing in the object class (here “knee osteoarthritis”).

Note that while the context, subject, and object slots are filled with classes, the relation targets their instances and not the classes themselves. The full specification of the super-pattern ontology can be found here: Super-pattern ontology.

The context class is optional, whereas all the other slots are mandatory. For practical purposes, the ontology above defines a “universal context” for the case where no specific context applies, but in this study we will simply use the placeholder “NONE”.

Task Instructions

This study has three parts and each of the parts consists of 10 tasks to formalize scientific claims. Before working on these three parts, we show you examples of claims with their complete formalization with the super-pattern. A few things to consider:

- This study doesn’t involve any vocabulary lookup. We therefore only refer to classes by their (assumed) names. When we ask you to decide on a class, we basically ask for providing the name you think the class should probably have if it exists.
- The classes in the context, subject or object classes slots would often be expressed as compound classes, constructed from existing classes with operations such as unions, intersections, and property restrictions. We do not focus here on this topic but simply assume that these classes are defined as classes in their own right and named accordingly (e.g. “young person who lives in a country with low political stability”).
- The different qualifiers (“generally”, “generally not”, etc.) are further defined in the Super-pattern ontology (see above). Qualifiers involving “can” (“can generally”, “can generally not”, etc.) are interpreted according to modal logic semantics of possible worlds. “Can” therefore means “there is at least one accessible possible world where the given statement is true” or “it is possible to make it become true”.
- We show you just single (AIDA) sentences for the claims to be formalized. These sentences come from the abstracts of actual papers, but we ask you to only take the sentence as input for your formalizations. If you are uncertain, make a best guess.

Examples

To better understand the tasks, you can have a look at these fully filled-in examples:
Link to Examples

Tasks, Part 1

In this part of the study you need to choose the qualifier and relation. The class names for the context class (if any) and the subject and object classes are set. This part contains 10 tasks/claims.

Link to Part 1 [we will provide you with the link after the instruction session]

Tasks, Part 2

In this part of the study you need to add the class names for the context class (if any), subject and context classes. The qualifier and relation are set. This part contains 10 tasks/claims.

Link to Part 2 [we will provide you with the link after the instruction session]

Tasks, Part 3

In this part of the study you need to fill in the fields for the whole super-pattern: to add the class names for the context class (if any), subject and context classes and to choose the qualifier and relation. This part contains 10 tasks/claims.

Link to Part 3 [we will provide you with the link after the instruction session]