

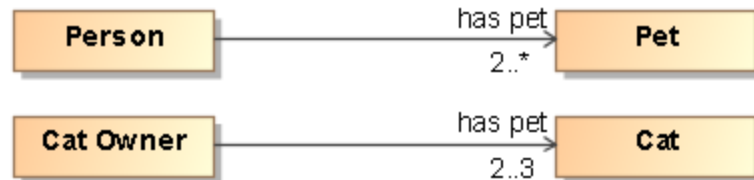
# Cardinality restrictions

There are two kinds of cardinality restrictions: **qualified** and **unqualified**. This page explains both kinds, but we must consider the following setup model.

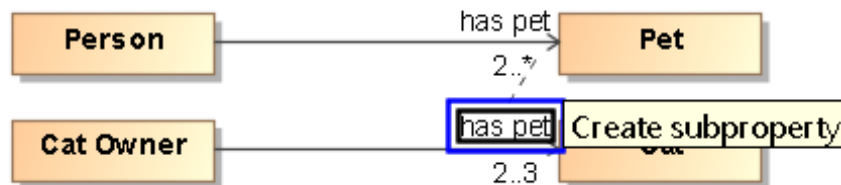
## Setup Model

To set up the case for qualified and/or unqualified cardinality restrictions

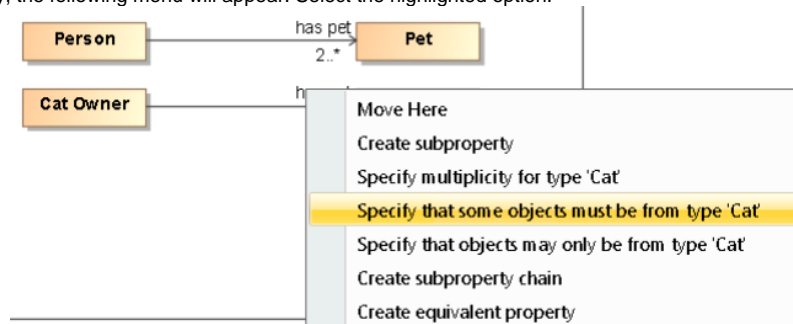
1. Create four classes and two unidirectional object properties such that it looks as shown below.



2. Drag and drop the top *has pet* property onto the bottom *has pet* property until you see the **Create subproperty** text.



3. Once you drop the property, the following menu will appear. Select the highlighted option.



4. The result should look as shown below. Notice the restriction *{subset has pet}*.



5. Now, we export to OWL.



### OWL Functional

In order to follow the rest of the explanation, set your OWL export syntax to **OWL Functional** as shown below.

OWL Export Syntax

OWL Functional

## Excerpt of the OWL ontology

The following code block shows an excerpt of the OWL ontology that marks the distinction between qualified and unqualified cardinality restrictions.

```
# Class: :CatOwner (Cat Owner)

AnnotationAssertion(rdfs:label :CatOwner "Cat Owner"^^xsd:string)
SubClassOf(:CatOwner ObjectMinCardinality(2 :hasPet :Cat))
SubClassOf(:CatOwner ObjectMaxCardinality(3 :hasPet :Cat))

# Class: :Person (:Person)

SubClassOf(:Person ObjectMinCardinality(2 :hasPet))
```

## Unqualified Cardinality Restriction

From the OWL ontology excerpt above, line 9 shows an unqualified cardinality restriction. It is an unqualified cardinality restriction because the property's type emanating from *Person*, *Pet* with cardinality of 2..\* does not specify the *Pet*, such as *Cat*, that the *Person* could have.

## Qualified Cardinality Restriction

From the OWL ontology excerpt above, line 4 shows a qualified cardinality restriction. It is a qualified cardinality restriction because the property's type emanating from *Cat Owner*, *Cat* with cardinality 2..3 specifies the pet, *Cat*, and the restriction actually says

:**Cat**. In other words, the restriction in line 4 is more specific than the restriction in line 9; that's why the cardinality restriction in line 4 is qualified.

### Related Pages

- [Concept Modeling Semantics](#)