

When is a property composite?
<ul style="list-style-type: none"> • The <i>top</i> and <i>bottom</i> properties are all composite. • Any property that is itself <i>transitive</i> or has an <i>inverse</i> property that is transitive. • Any property that has a <i>transitive</i> subproperty, or a subproperty the <i>inverse</i> of which is transitive. • Any property that is the superproperty of a <i>property chain</i>, or is an <i>inverse</i> property of a superproperty of a property chain. • Any property that is an <i>equivalent</i> property of one of the above, or is the superproperty of a property that is equivalent to one of the above. <p>Composite properties are sometimes called complex roles or non-simple properties.</p>
Restrictions
<p>Composite properties may not occur in the following <i>axioms</i>:</p> <ul style="list-style-type: none"> • Qualified and non-qualified <i>cardinality</i> restrictions on classes; • <i>Self</i> restrictions on classes, • <i>Disjoint</i> property axioms. <p>They may furthermore not be assigned the following <i>property types</i>:</p> <ul style="list-style-type: none"> • Functional or inverse functional; • Irreflexive; • Asymmetric.

Table 4.1: Restrictions on composite properties

Transitive properties are so-called *composite* properties: they can be said to be composed of multiple steps. For instance, given:

```
:BaronWayApartment :isPartOf :BaronWayBuilding .
:BaronWayKitchen   :isPartOf :BaronWayApartment .
```

a reasoner will infer :

```
:BaronWayKitchen   :isPartOf :BaronWayBuilding .
```

This last *:isPartOf* relation is composed of the two preceding property assertions. Because of this composition, transitive properties are subject to a number of restrictions listed in table 4.1.

Symmetric and Asymmetric Properties Some properties, such as *:isAdjacentTo*, are *symmetric*; that is, if *a* *:isAdjacentTo* *b*, the inverse holds as well. In other words, symmetric properties are equivalent to their inverse (see 4.4.4). For other properties