# The issue is about how to define asymmetric and irreflexive.

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## Background

Usually the prefix 'non-' in a compound negates the main part. So 'non-symmetric' should have the same meaning as 'not symmetric'.

From Latin the prefix 'in-' has a similar function.  So irreflexive means 'not reflexive'.

From Greek the prefix 'a-/an-' has  a similar function: asymmetric is a+symmetric (as Ancient Greek ἀσυμμετρία (asummetría), “disproportion, deformity”, wiktionary.org).

This is not very helpful since 'non-symmetric', 'asymmetric' and 'not symmetric' all have the same general meaning. However, this is not the case for specialized language in a given domain.  In set theory the terms 'asymmetric' and 'irreflexive' have a specialized meaning stronger than just 'not ...':

1) A relation R is asymmetric if there are no pair x,y  such that x relates to y and at the same time y relates to x. 'less than' (<) is a good example of an irreflexive relation.

2) A relation R is irreflexive  if no x is related to itself. 'less than’ (<) is a good example of a asymmetric relation.

In the formal parts of the definition of CRM we use first order logic and follow standard definitions in set theory. In CRM 'P is not reflexive' means that at least one x is not related via P to itself. My suggestion is that we use 'irreflexive' and 'asymmetric'  as in common set theory:

A) reflexive: for a property P with domain and range E, P(x,x) for all instances x in E.

B) irreflexive: for a property P with domain and range E, P(x,x) for no instance x in E.

C) non-reflexive/’not reflexive’: For a property P with domain and range E, P(x,x) is not true for one or more instances x in E.

B implies C, so non-reflexive/’not reflexive’ is weaker.

## Proposal:

Change from noun to adjective; add two new entries in the term definition list.

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| asymmetric | asymmetric is defined in the standard way found in mathematics or logic: A property P is asymmetric if the domain and range are the same class and for all instances x, y of this class the following is the case: If x is related by P to y, then y is not related by P to x. An example of a asymmetric property is E18 Physical Thing. P46 *is composed of (forms part of)*: E18 Physical Thing. |
| irreflexive | irreflexive is defined in the standard way found in mathematics or logic: A property P is irreflexive if the domain and range are the same class and for all instances x, of this class the following is the case: x is not related by P to itself. An example of a irreflexive property is [E33](#_toc7918) Linguistic Object. P73 *has translation (is translation of)*: [E33](#_toc7918) Linguistic Object. |
| symmetric~~symmetry~~ | Symmetric ~~Symmetry~~ is defined in the standard way found in mathematics or logic: A property P is symmetric if the domain and range are the same class and for all instances x, y of this class the following is the case: If x is related by P to y, then y is related by P to x. The intention of a property as described in the scope note will decide whether a property is symmetric or not. An example of a symmetric property is E53 Place*. P122 borders with:* E53 Place. The names of symmetric properties have no parenthetical form, because reading in the range-to-domain direction is the same as the domain-to-range reading.  |
| reflexive~~reflexivity~~ | Reflexive~~Reflexivity~~ is defined in the standard way found in mathematics or logic: A property P is reflexive if the domain and range are the same class and for all instances x, of this class the following is the case: x is related by P to itself. The intention of a property as described in the scope note will decide whether a property is reflexive or not. An example of a reflexive property is E53 Place*. P89 falls within (contains):* E53 Place.  |