# OCL

## Object Constraint Language

Using OCL, invariants can be applied to validate the models semantics.

**Invariants using the OCLinEcore Editor:**

```
class <classname>
{
	invariant <name>: <body>;
	…
	property …;
	…
	attribute …;
	…
}
```

(Due to NSPrefix not being set in the Vespucci meta model, the Problems View might show an error concerning: no viable alternative at input '=')

**Collections:**

| Collection(T) | Unordered | Ordered |
|---|---|---|
| Non-Unique | Bag(T) | Sequence(T) |
| Unique | Set(T) | OrderedSet(T) |

- `collect`:
- `closure`: recursive closure oft the collection
  - e.g. parents->closure(children)
    computes parents.children, parents.children.children, etc.
- `reject`: a negative filter, rejecting all objects satisfying the condition.
- `select`: a positive filter showing only those objects that satisfy the condition.
- `exists`: true if any object satisfies the condition.
- `forAll`: true if all objects satisfies the condition.

Use:

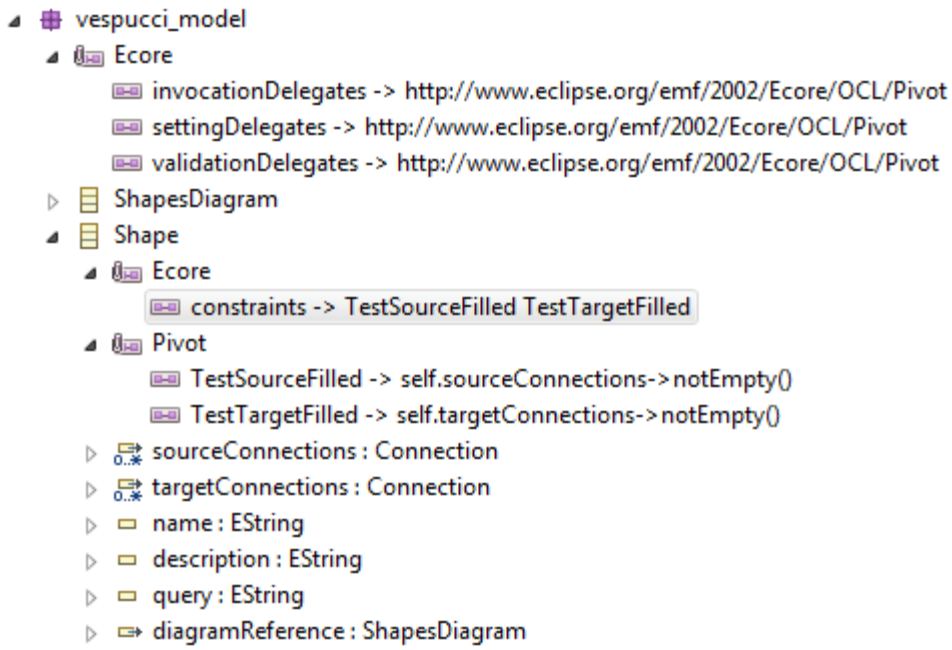
<collection>**->**<iterator>**(**<iterator>**:** <type> **|** <body>**)**

e.g.

```
parents.children->
	forAll(x, y: children | x <> y implies x.name = y.name)
```

all children should have different names

**Integrating OCL via EAnnotations:**




'Ecore' Source setting: http://www.eclipse.org/emf/2002/Ecore
'Pivot' Source setting: http://www.eclipse.org/emf/2002/Ecore/OCL/Pivot

| Java (implementation) | OCL (specification) |
|---|---|
| boolean,Boolean,true,false | Boolean,true,false |
| short,int,long,Integer,BigInteger | **Integer**, UnlimitedNatural |
| float, double, BigDecimal | **Real** |
| Character, String, 'c', "line\n" | String, 'c', **'**line\n**'** |
| Object,this,null | OclAny,**self**,null |
| Exception | **invalid** |
| | |
| Integer value | value : Integer |

Source: http://www.slideshare.net/EdWillink/enrich-your-models-with-ocl

| Java (implementation) | OCL (specification) |
|---|---|
| +, -, *, / | +, -, *, / |
| !, &&, \|\|, ^ | not, and, or, xor, implies |
| <, >, <=, >= | <, >, <=, >= |
| ==, != | =,<> |
| Math.max(4,5) | 4.max(5) |
| | |
| if (a) b; else c; | if a then b else c endif |
| Integer value = 5;<br>doSomething(value); | let value : Integer = 5<br>in doSomething(value) |

Source: http://www.slideshare.net/EdWillink/enrich-your-models-with-ocl

Eclipse OCL
http://wiki.eclipse.org/MDT/OCL

Eclipse Update Page:
http://download.eclipse.org/modeling/mdt/ocl/updates/

OCL Specification:
http://www.omg.org/spec/OCL/2.3/Beta2/

OCL Integration:
http://help.eclipse.org/indigo/index.jsp?topic=%2Forg.eclipse.ocl.doc%2Fhelp%2FIntegration.html

Slideshare with examples:
http://www.slideshare.net/EdWillink/enrich-your-models-with-ocl

Implementing Model Integrity in EMF with MDT OCL (2006/2007):
http://www.eclipse.org/articles/article.php?file=Article-EMF-Codegen-with-OCL/index.html