



OCL

UML Binding

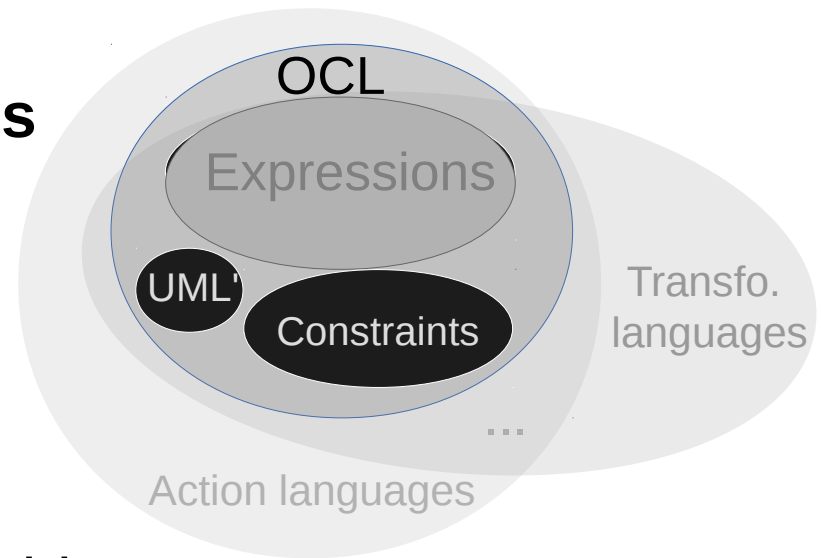
context

attribute/operation access

navigation through/to/from association

UML-based OCL

- access to **attributes**, to **operations**
- navigation
 - TROUGH **associations**
 - TO **class associations**
 - FROM **class associations**
 - TROUGH **qualified associations**
- **class** extensions and **class** hierarchies





OCL & UML Attributes / Operations

Access to Attributes/Methods

object . attribute

- Could be Undefined (e.g. `age:Integer[0..1]`). See `->isEmpty()`

self.birthDay

object . operation(`expr1`, `expr2`, ...)

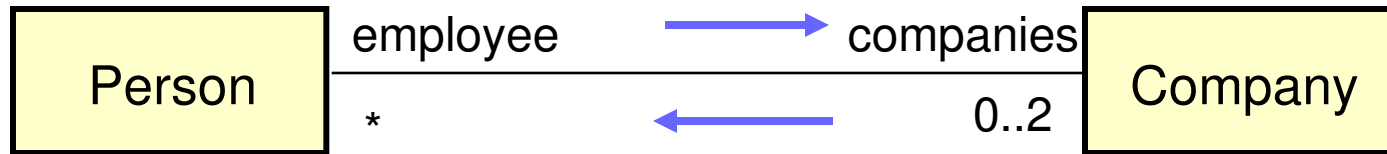
- Access to non side effect operation(**{query}**)

self.salary(1998)



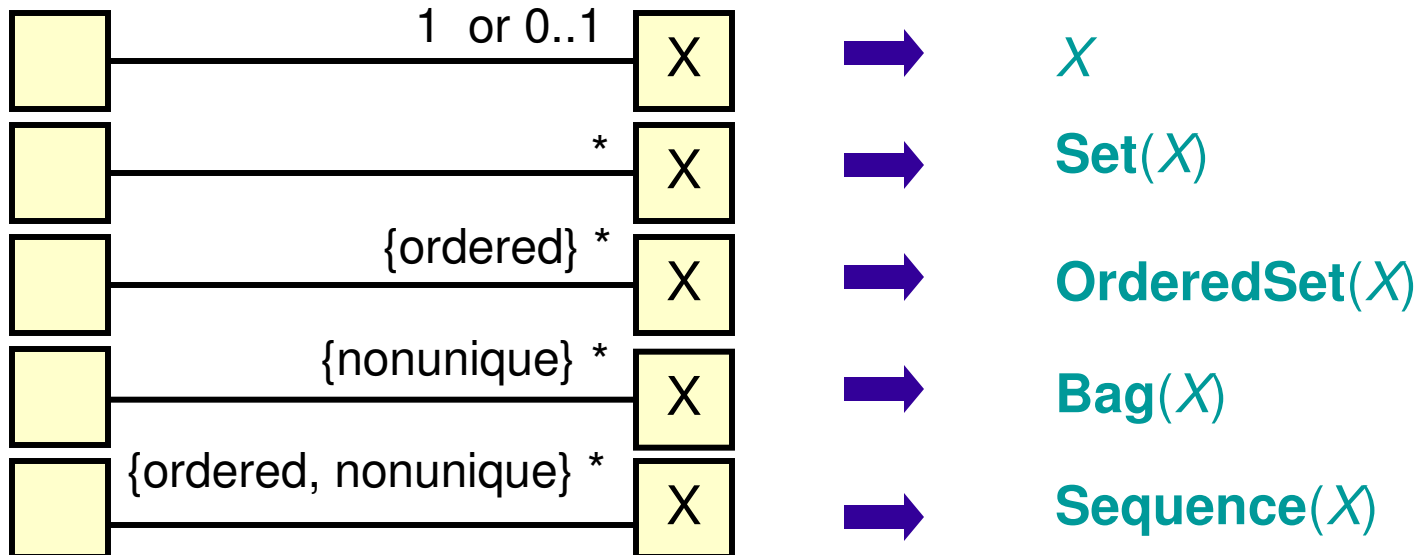
OCL & UML Associations

Navigation TROUGH an Association



object.role

type



Examples

self.father	➡ <i>Person</i>	0..1
self.cars	➡ Set (<i>Car</i>)	*
self.children	➡ OrderedSet (<i>Person</i>)	* {ordered}
self.spouses	➡ Sequence (<i>Person</i>)	* {ordered,nonunique}

Navigation

Testing Emptiness

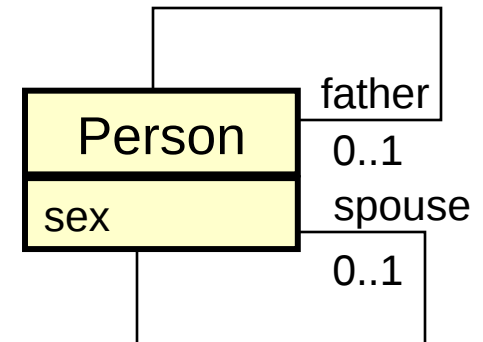
- Recall: an element is converted to a singleton
self.father->size() <= 1

- Used to test emptiness

self.father->isEmpty()

self.spouse->notEmpty() implies

self.spouse.sex = Sex::female

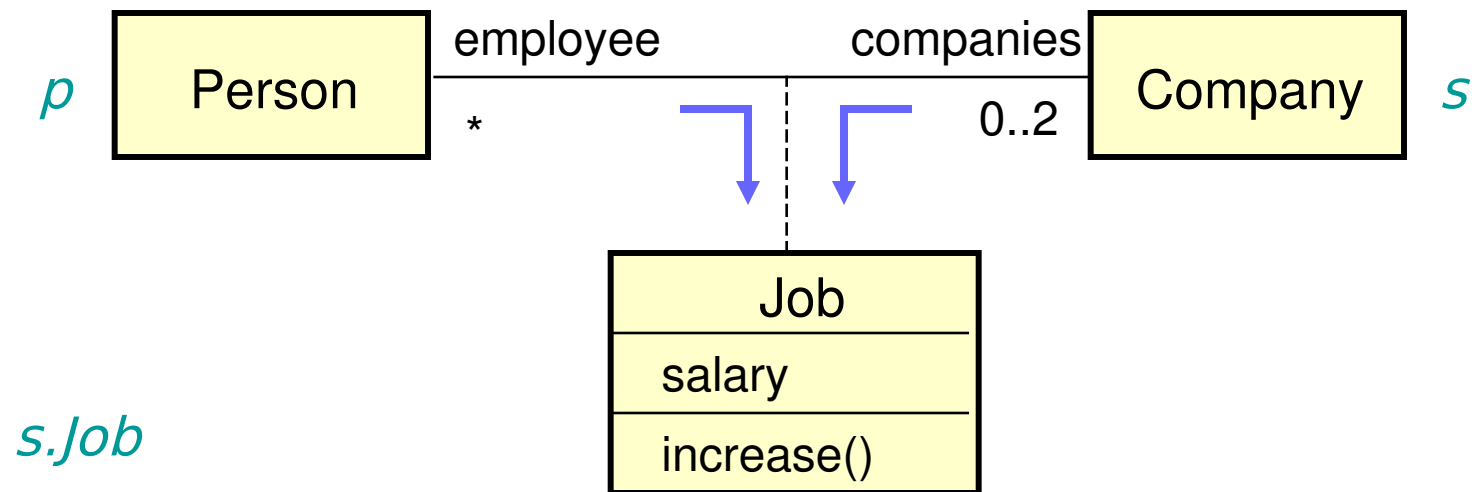


Navigation

TOWARDS a Class Association

objet . association

- returns the object-link instances



s.Job

p.Job

s.Job->collect(salairty)->sum()

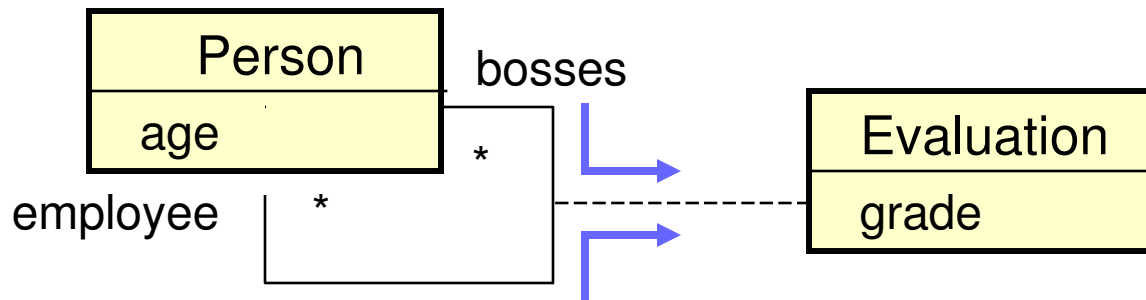
s.Job.salary->forall(x / x>500)

Navigation

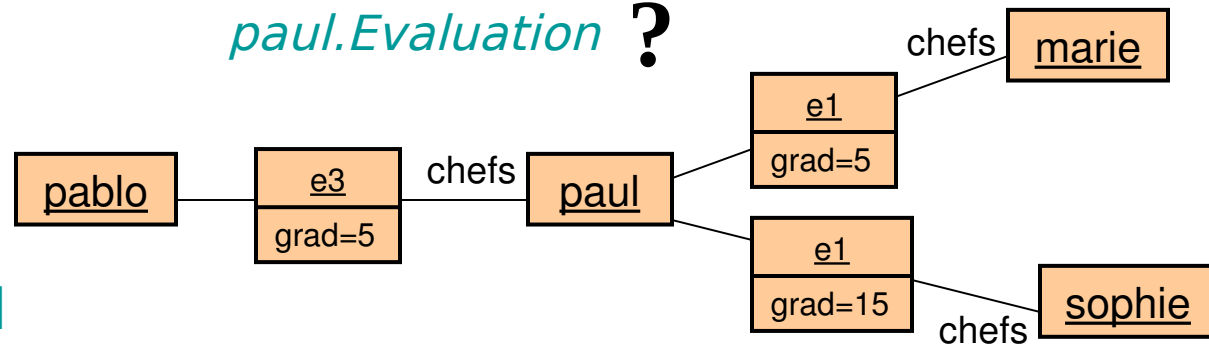
TOWARDS a Reflexive Class Association

objet . association [role]

- Navigation direction to be given (towards role)



paul.Evaluation ?



paul.Evaluation [bosses]

paul.Evaluation [employees]

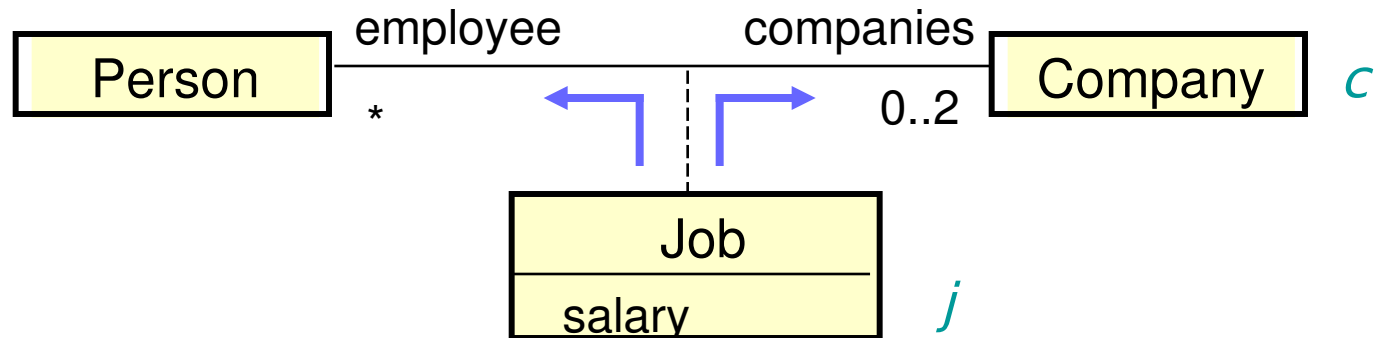
paul.Evaluation [bosses].grade-> sum()/paul.bosses->size()

Navigation

FROM a Class Association

link . role

- access to object at link « ends »
- Always one and only one object



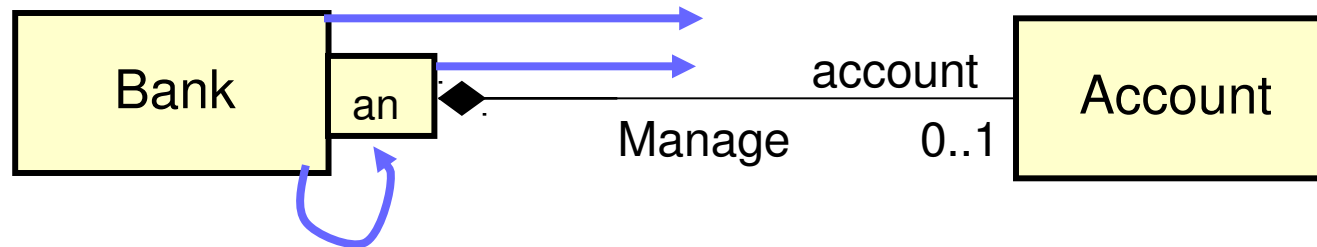
j.employee

j.companies

c.job->select(salary<1000).employee

Navigation

THOUGH a Qualified Association



link . role [value, value, ...]

- Qualified access

b.account[4029]
b.account[0]

link . role


■ codomain

b.account

link . role . key

■ domain

b.Manage.nc



OCL & UML Classes

OCL & Classes

Class.classProperty

Access to a (« static ») class attribute

Class.allInstances()

Extension of the class (set of all instances)

Person.allInstances()->size() < 500

Person.allInstances()->forall(p1,p2 |

p1<>p2 implies p1.numsecu <> p2.numsecu)

Person.allInstances()->isUnique(numsecu)

OCL & UML Class Inheritance

objet . **oclIsTypeOf**(*type*)

- direct type

objet . **oclIsKindOf**(*type*)

- direct type or supertypes

objet . **oclAsType**(*type*)

- type conversion

