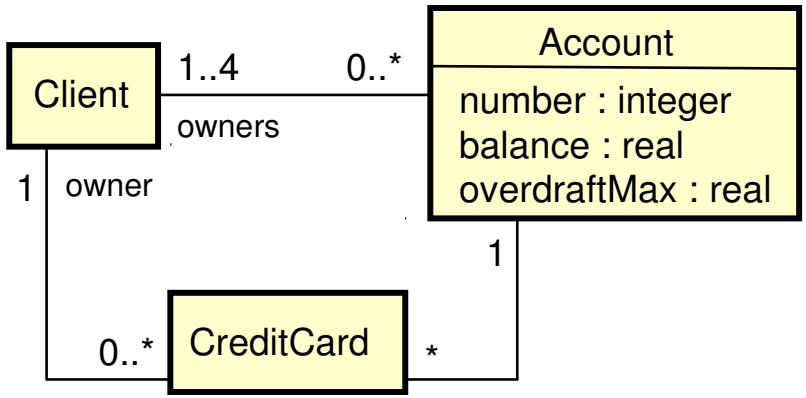
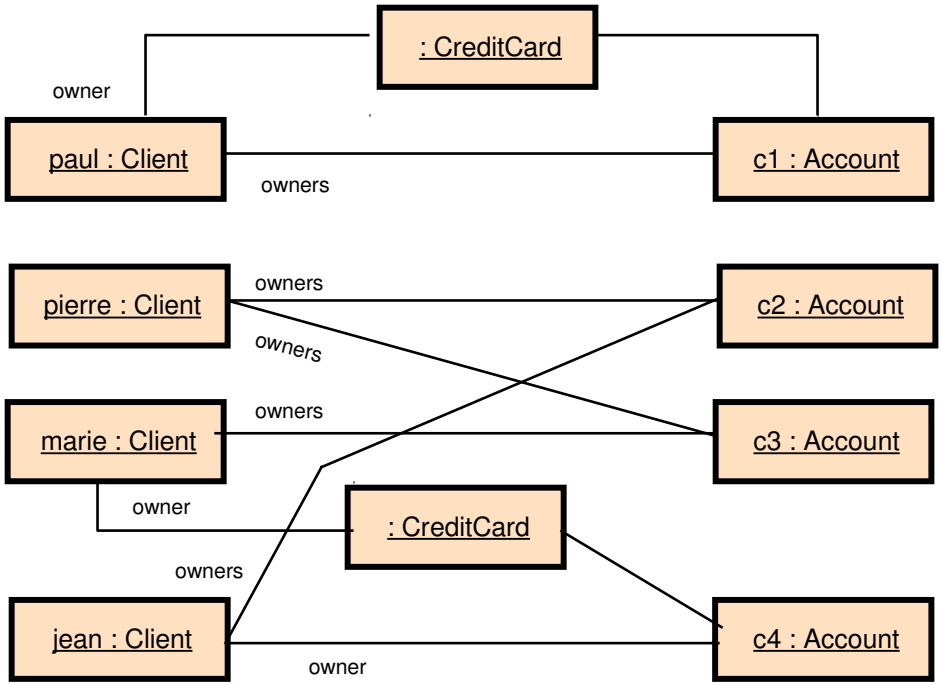
OCL
Introduction

Shared Illusions (shared or not shared...)



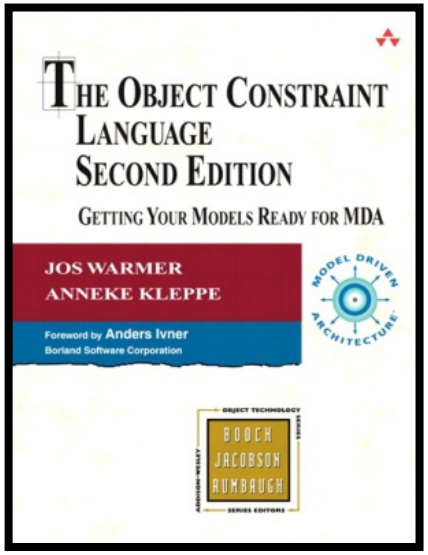
Be careful with what could seem « obvious »



Constraints
Expressed in Natural Language

- Constraints MUST be written
- Cope with limitations of UML diagrams
- Using UML notes + free text
- Specifications as soon as possible
- Everybody can (more or less) understand
- Ambuiguities, lack of precision, etc.
- => SBVR standard

OCL for Precise Modeling (OCL@M1)



More or less readable

Reasonably easy to write (in simple cases)

context *Flight*

inv: *nbOfPotentialyFreeSeats =*

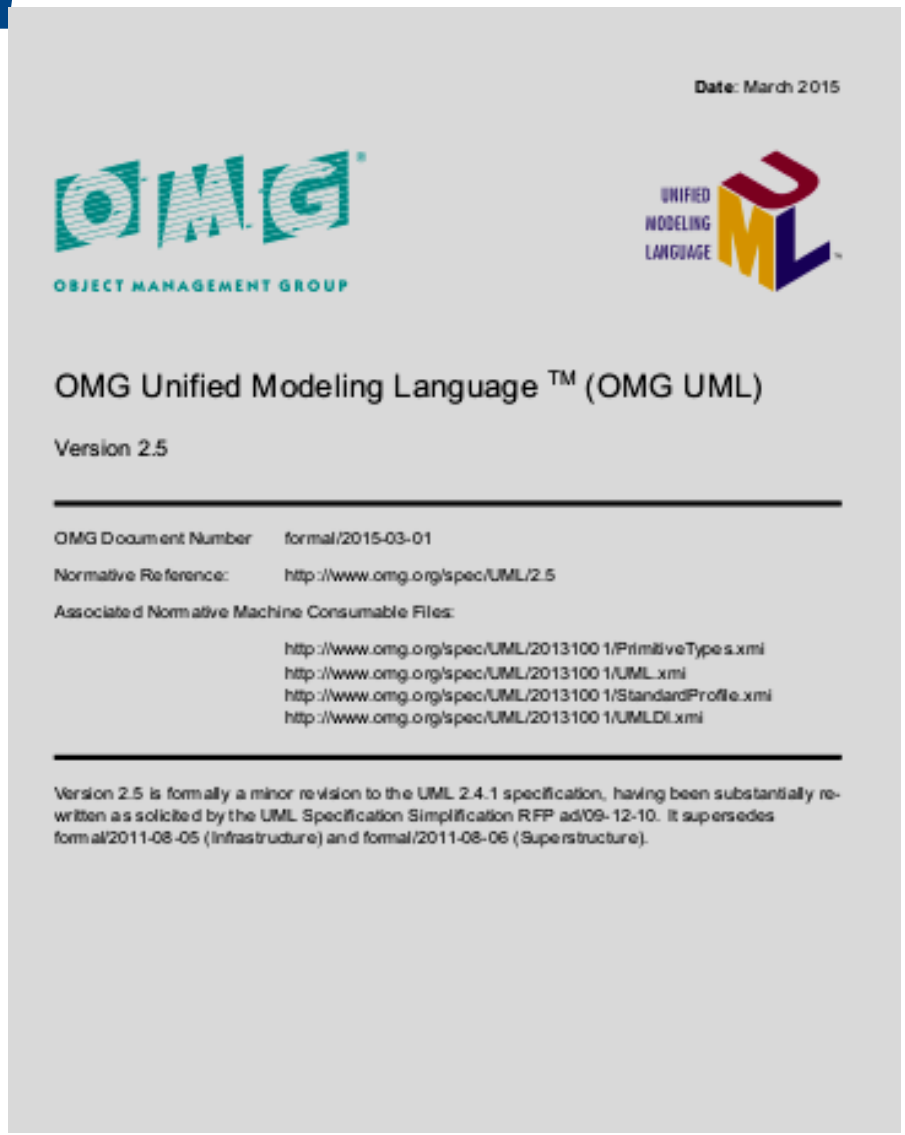
*self.plane.seatNb – self.bookings->**select**(isConfirmed).nbPassenger->**sum**()*

- No "strange" symbols

context *Flight*

inv: *self.isDefined **implies** self.bookings->**forAll**(isConfirmed **implies** isPaid)*

OCL for Metamodeling (OCL@M2)



Date: March 2015

OBJECT MANAGEMENT GROUP

UNIFIED MODELING LANGUAGE

OMG Unified Modeling Language ™ (OMG UML)

Version 2.5

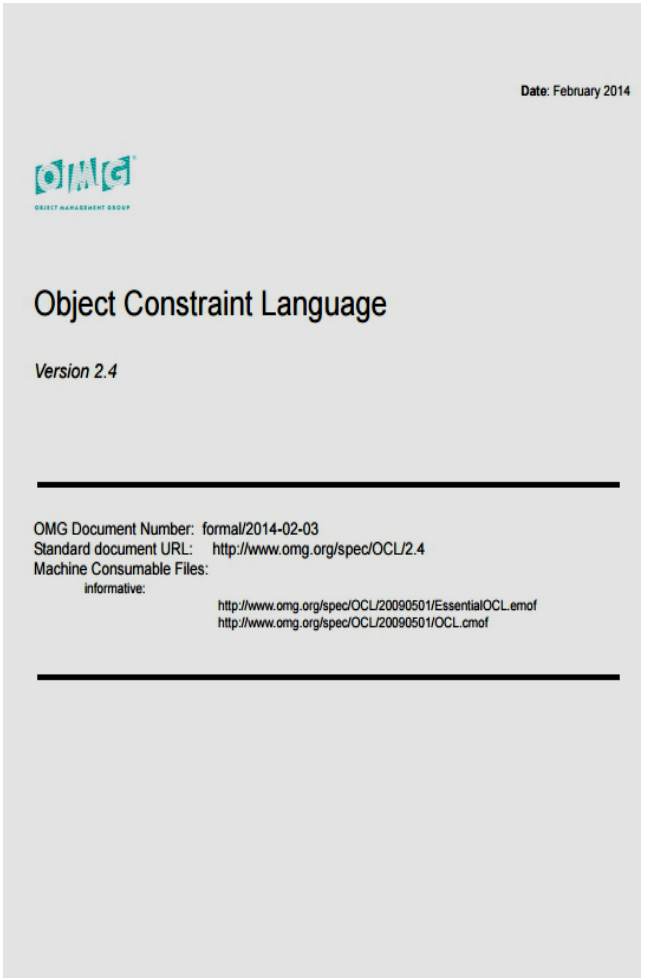
OMG Document Number: formal/2015-03-01

Normative Reference: http://www.omg.org/spec/UML/2.5

Associated Normative Machine Consumable Files:

http://www.omg.org/spec/UML/20131001/PrimitiveTypes.xmi
http://www.omg.org/spec/UML/20131001/UML.xmi
http://www.omg.org/spec/UML/20131001/StandardProfile.xmi
http://www.omg.org/spec/UML/20131001/UMLDI.xmi

Version 2.5 is formally a minor revision to the UML 2.4.1 specification, having been substantially re-written as solicited by the UML Specification Simplification RFP ad/09-12-10. It supersedes formal/2011-08-05 (Infrastructure) and formal/2011-08-06 (Superstructure).



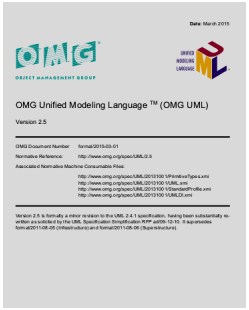
Date: February 2014

Object Constraint Language

Version 2.4

OMG Document Number: formal/2014-02-03
Standard document URL: http://www.omg.org/spec/OCL/2.4
Machine Consumable Files:
informative:
http://www.omg.org/spec/OCL/20090501/EssentialOCL.emof
http://www.omg.org/spec/OCL/20090501/OCL.cmof

Example: UML Metamodel with OCL



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[1] If this property is owned by a class, associated with a binary association, and the other end of the association is a
by a class, then opposite gives the other end.

```
opposite =
    if owningAssociation->notEmpty() and association.memberEnd->size() = 2 then
        let otherEnd = (association.memberEnd - self)->any() in
            if otherEnd.owningAssociation->notEmpty() then otherEnd else Set{} endif
    else Set {}
    endif
```

[2] A multiplicity on an aggregate end of a composite aggregation must not have an upper bound greater than 1.

```
isComposite implies (upperBound()->isEmpty() or upperBound() <= 1)
```

[3] Subsetting may only occur when the context of the subsetting property conforms to the context of the subsetted

```
subsettedProperty->notEmpty() implies
    (subsettingContext()->notEmpty() and subsettingContext()->forAll (sc |
        subsettedProperty->forAll(sp |
            sp.subsettingContext()->exists(c | sc.conformsTo(c)))))
```