Software Engineering

Advances in Software Architecture
From Objects First to Visual Programming

Lecture 21
2007/11/13

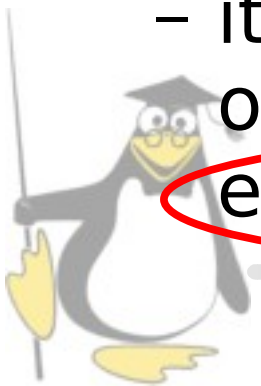
Last Lecture: UML

- usecase diagrams
- object diagrams
- class diagrams
- (activity diagrams)

- Announcement: http://www.fujaba.de/
  - allows MDA (more in my next lecture on 16th of November, Advances in Software Architecture)

Fujaba - http://www.fujaba.de

- From UML to Java And Back Again
- Fujaba is an “easy to extend UML / Story Driven Modelling and Graph Transformation platform with the ability to add plug-ins.”
  - it “combines UML class diagrams and UML behaviour diagrams (Story Diagrams) to a powerful, easy to use, yet formal system design and specification language.”
  - it “supports the generation of Java sourcecode out of the whole design which results in an executable prototype.”



Fujaba

- UML
- Story Driven Modeling
- Graph Transformation
- Class Diagrams <-> Story Diagrams
- java sourcecode -> executable prototype

Scenario: Towers of Hanoi

http://en.wikipedia.org/wiki/Towers_of_hanoi

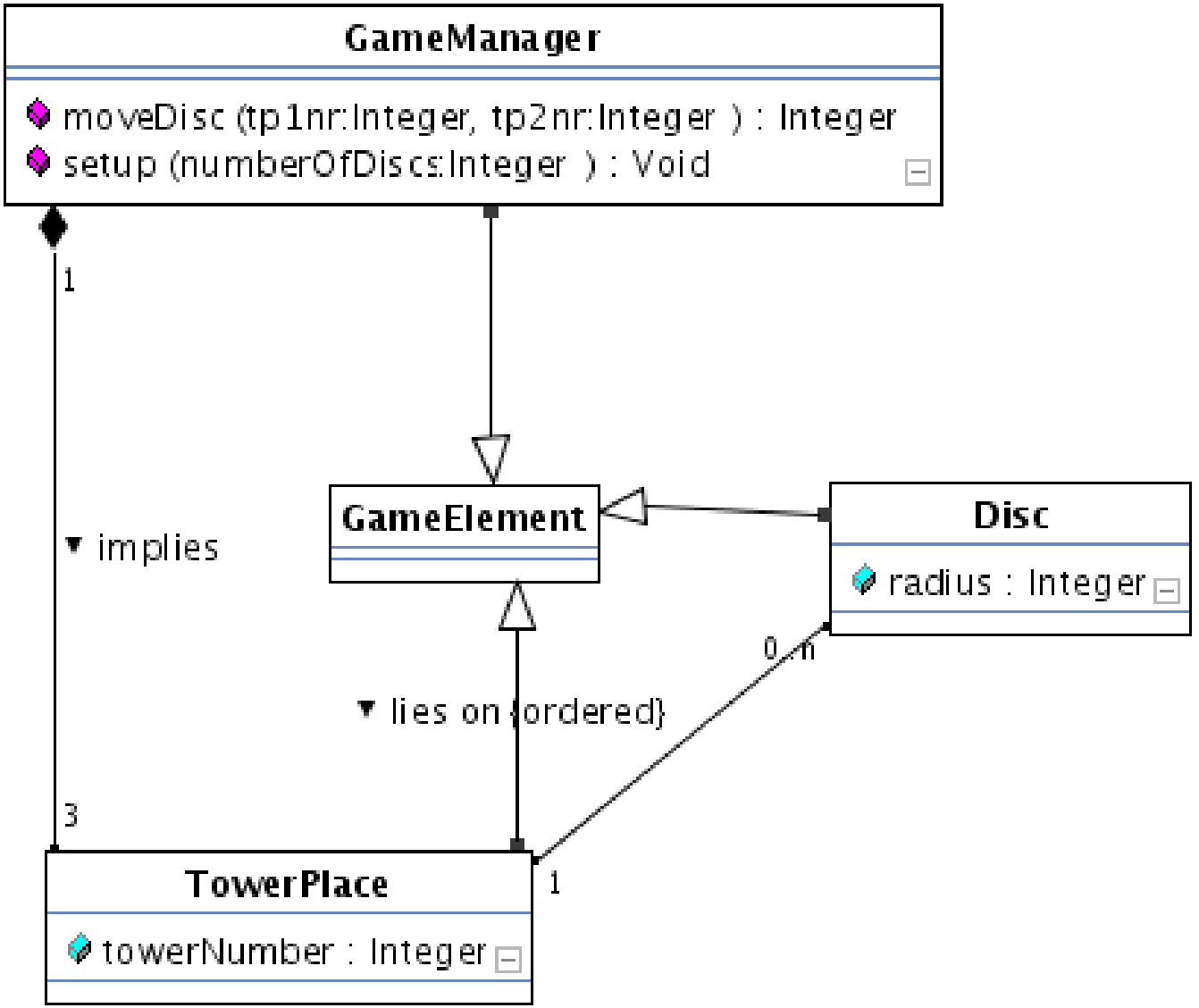
Usecase 1 – Hanoi setup

- Pre: 4 discs, different sizes (1,2,3,4), empty table
- define three places on table (tower-place)
- put the four discs in the right order on the first place
- Post: 4 discs, ordered on first tower-place

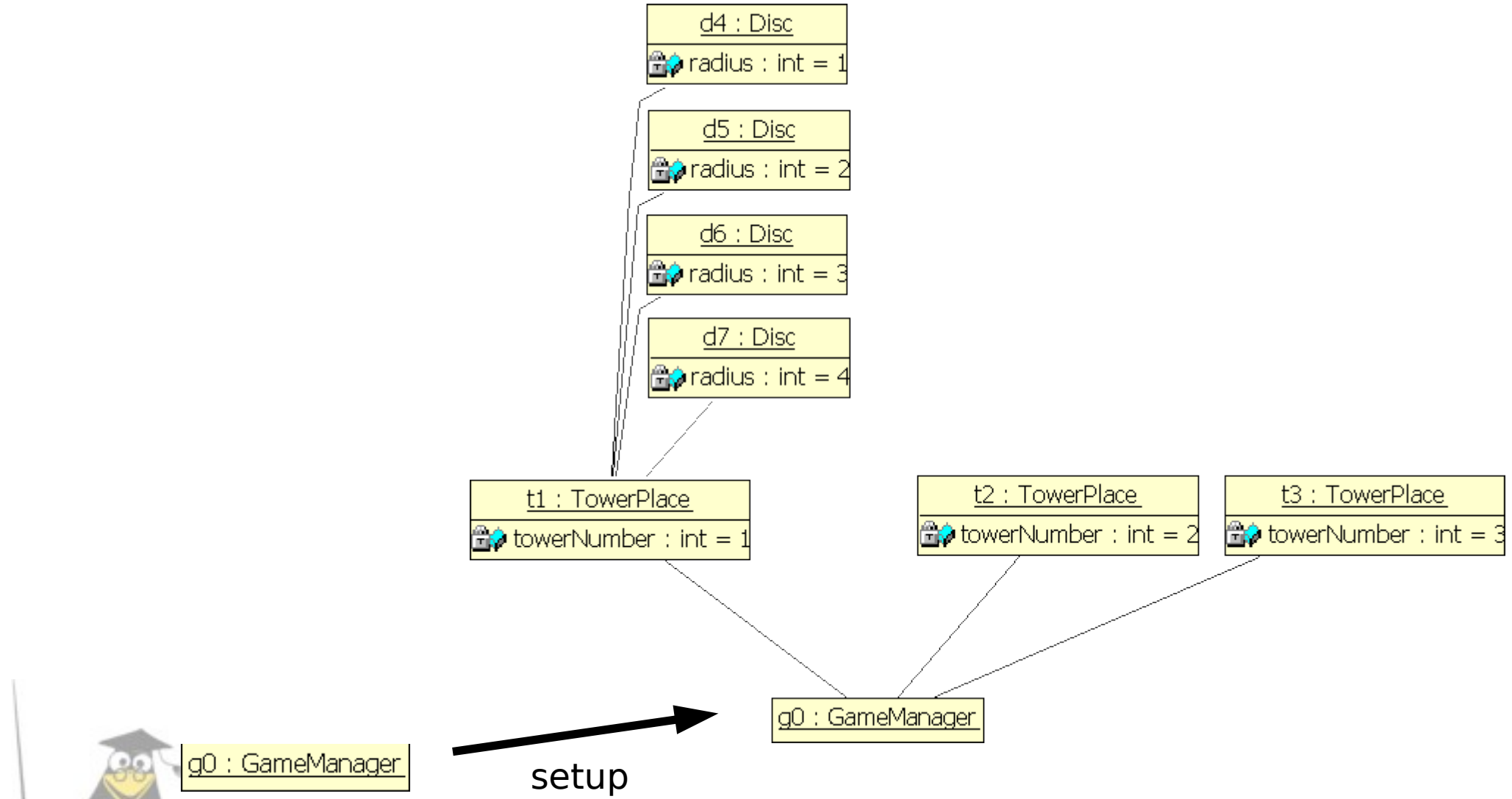
Usecase 2 – Initial move

- Pre: 4 discs, ordered (4,3,2,1) on first tower-place
- Move disc with radius 1 to second tower-place
- Post: 3 discs (4,3,2) on first tower-pace,
  1 disc (radius 1) on second tower-place

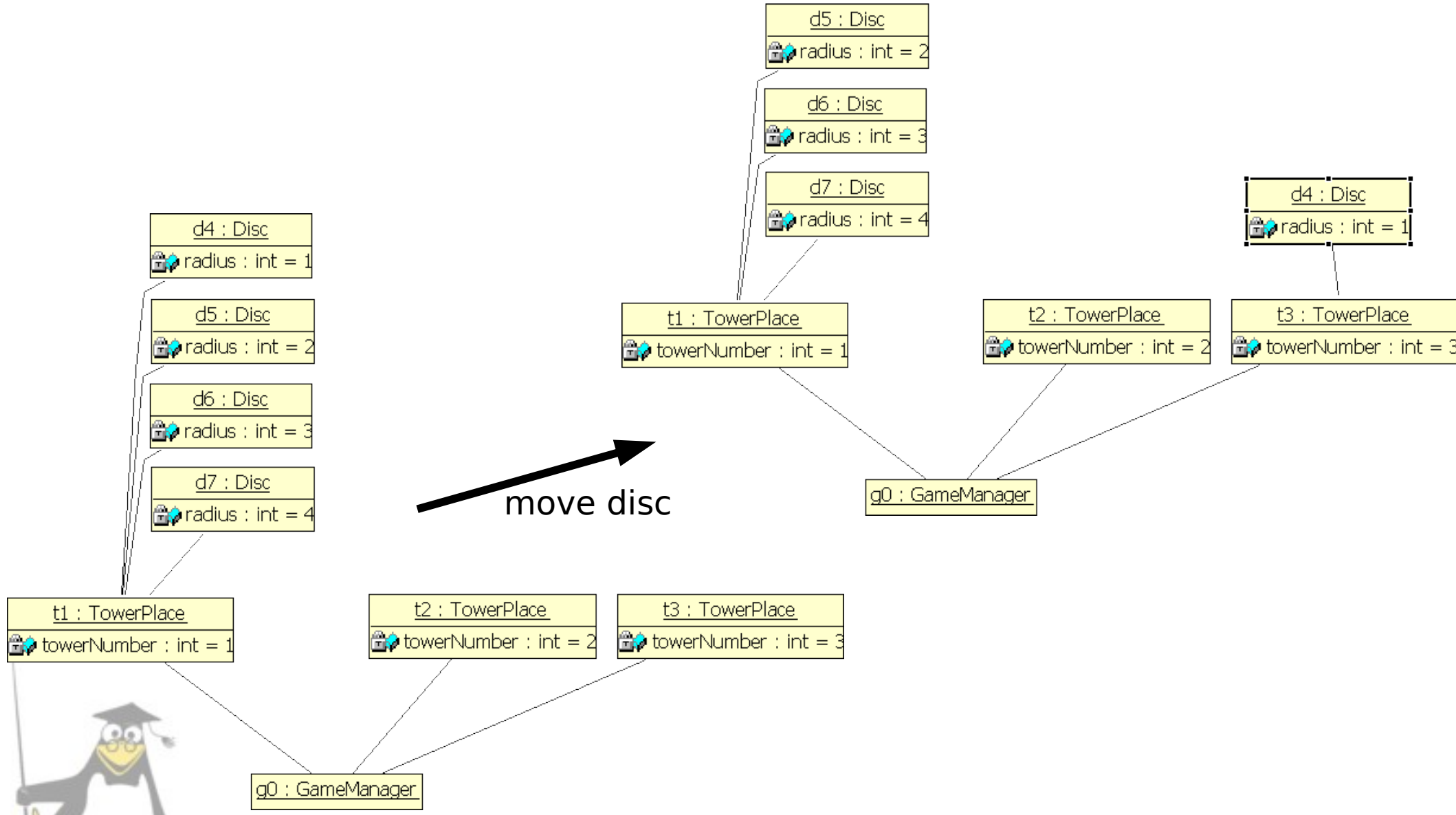
Class Diagram - Hanoi



Graph Transformation



Graph Transformation



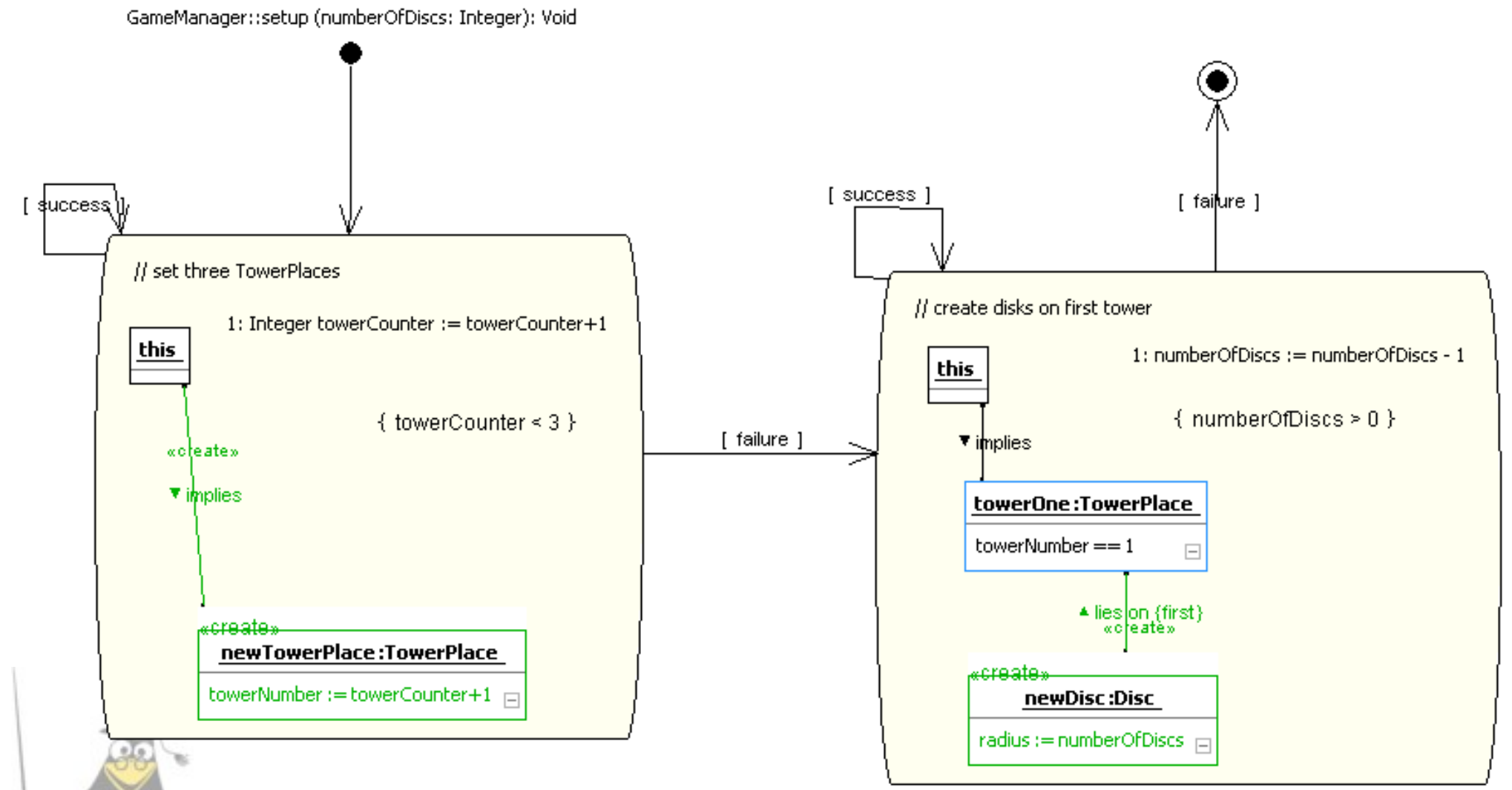
Practical work

- (install Java-JDK)
- install Fujaba
- load Hanoi_initial-Project
- start Dobs
  - create objects
  - connect objects
  - play through usecases
  - record steps for method-implementation

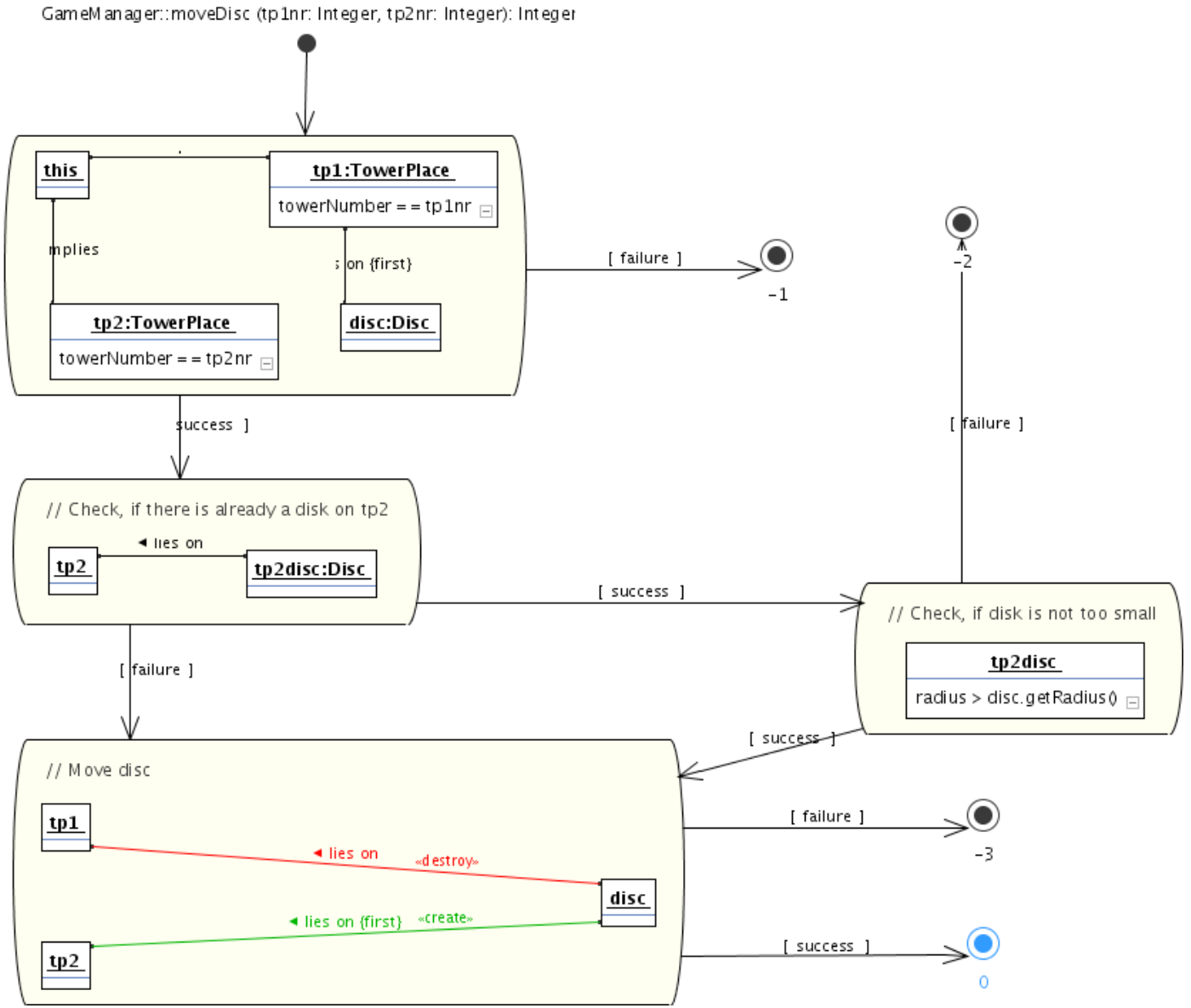
Create Methods

- Story driven modeling (shown in Fujaba)
- If you do not attend this class, compare documentation on http://www.fujaba.de (very limited) or drop into my office (311)

Setup (Example)

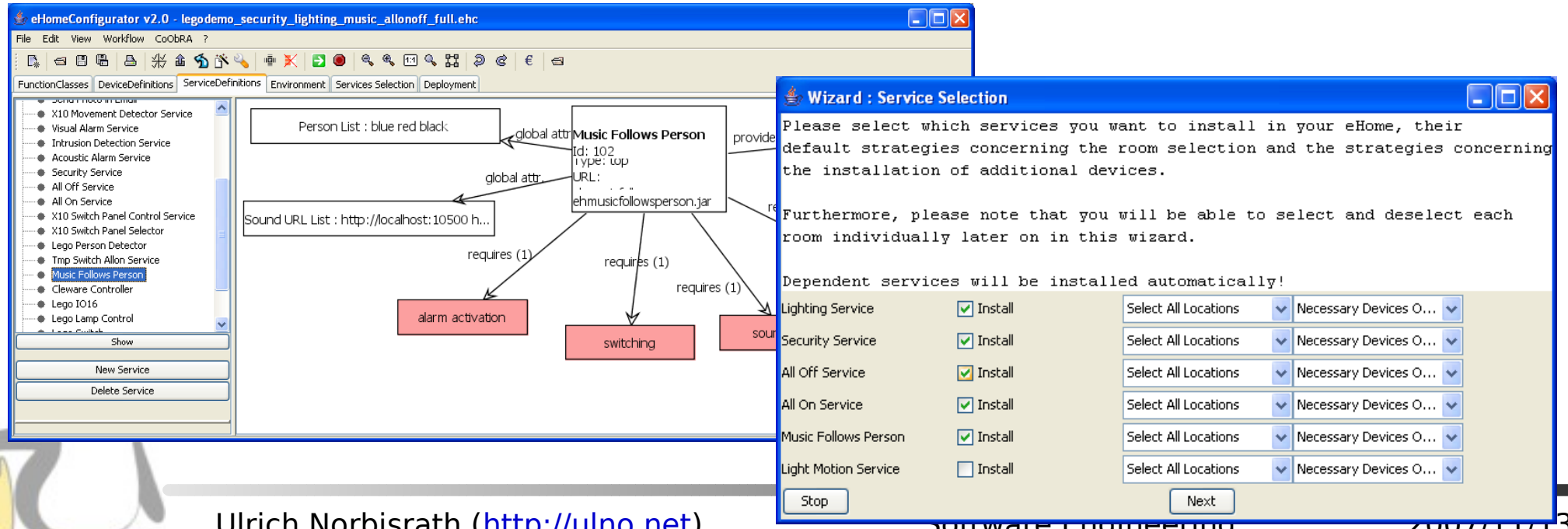


Move Disc (Example)



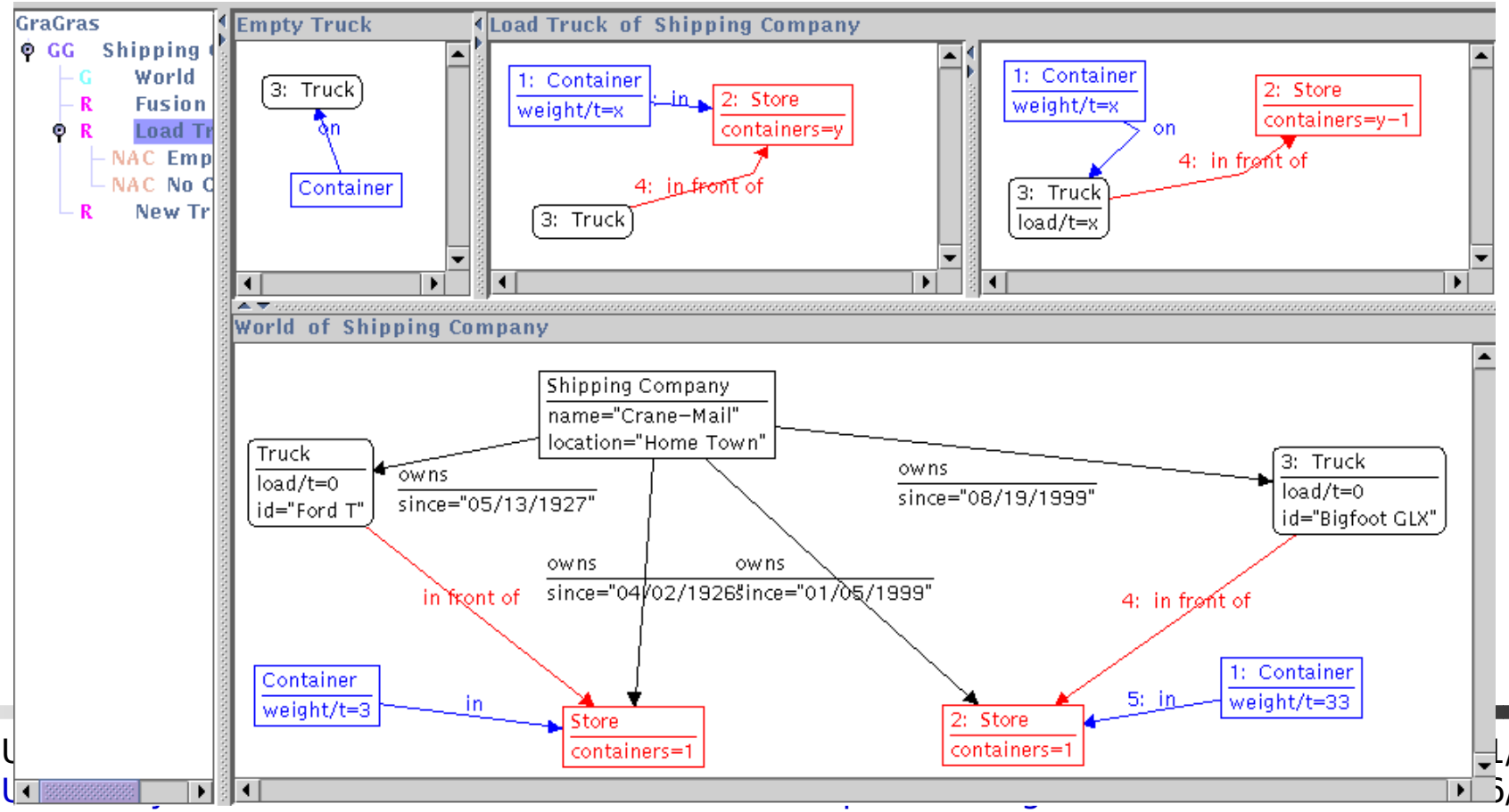
A Complex Example: eHomeConfigurator

- The class digram: eHomeModelComplete.pdf
- A story diagram: Activity_Service_install.pdf (resulting in about 1000 lines of java-code)
- Find more at: http://phd.ulno.net



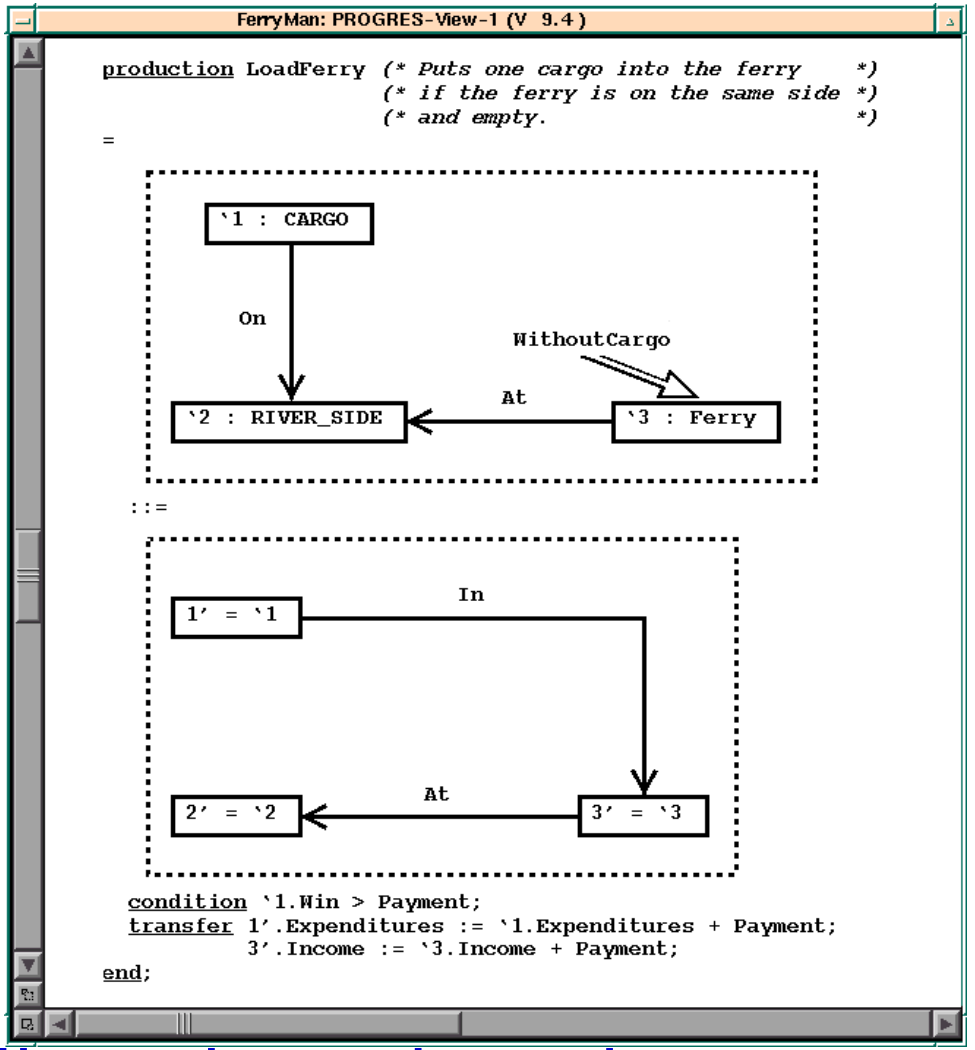
Other Graph Transformation Based Systems

- AGG:
  The Attributed Graph Grammar System
  http://tfs.cs.tu-berlin.de/agg



Other Graph Transformation Based Systems

- Progres:
  An integrated environment and very high level language for PROgrammed Graph REwriting Systems



http://www-i3.informatik.rwth-aachen.de/progres

Lessons Learned

- Objects First Design
- Story Driven Modeling
- Visual Programming Language