

Discussion on Properties of Bidirectional Transformations (or Multi-Directional Transformations?)

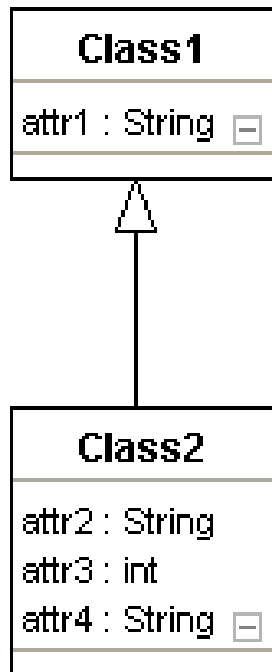
GRACE
International Meeting on
Bidirectional Transformations
(14. – 18.12.2008)

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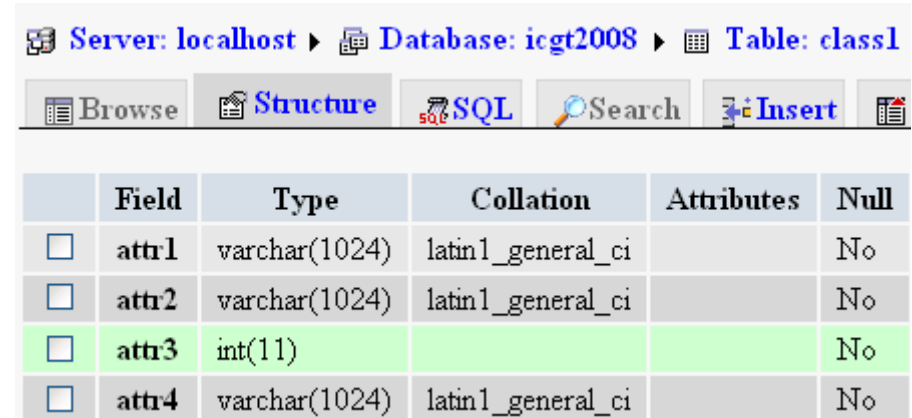


Running Example

- integration of Class Diagrams (CD) and Database Schemata (DB)



Class Diagram



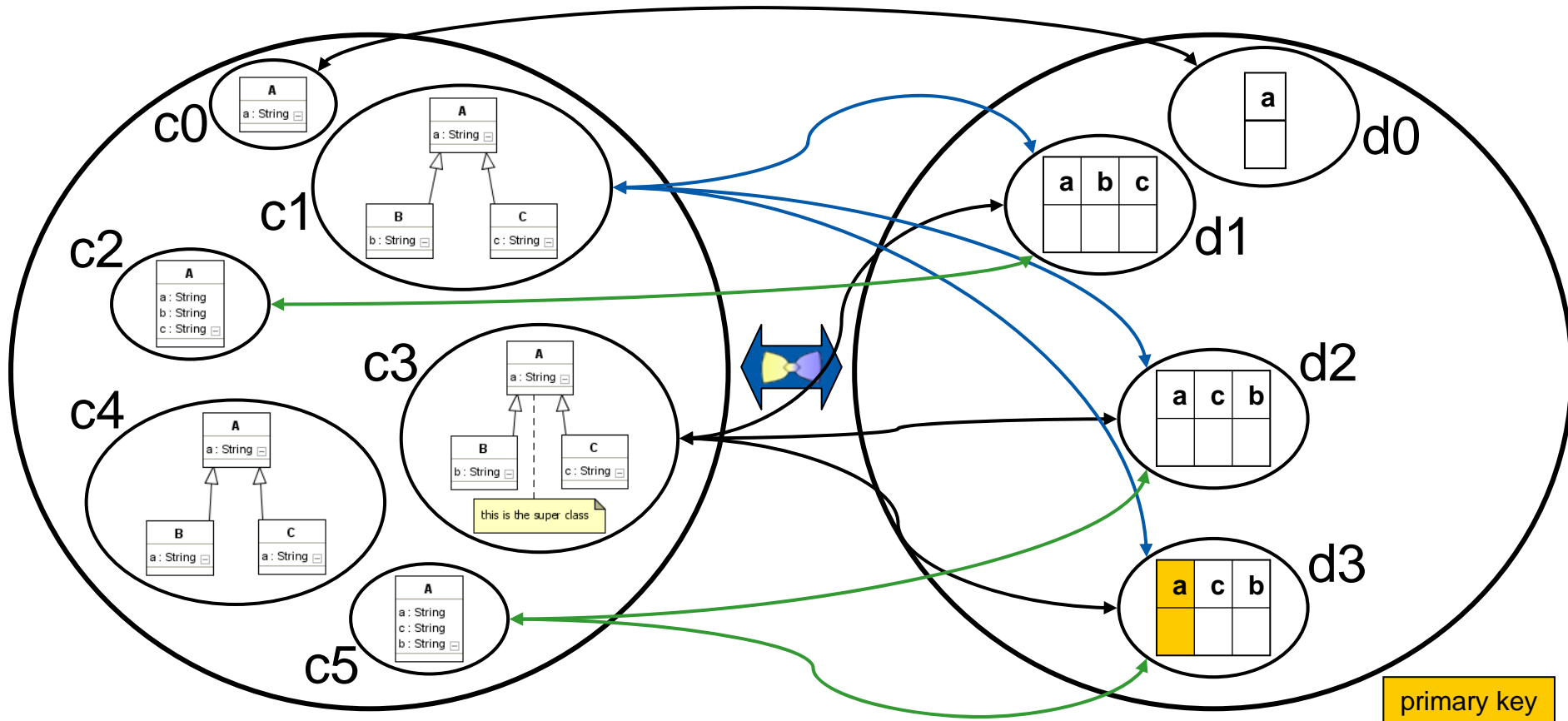
Server: localhost ▶ Database: icgt2008 ▶ Table: class1

Browse Structure SQL Search Insert

| | Field | Type | Collation | Attributes | Null |
|--------------------------|-------|---------------|-------------------|------------|------|
| <input type="checkbox"/> | attr1 | varchar(1024) | latin1_general_ci | | No |
| <input type="checkbox"/> | attr2 | varchar(1024) | latin1_general_ci | | No |
| <input type="checkbox"/> | attr3 | int(11) | | | No |
| <input type="checkbox"/> | attr4 | varchar(1024) | latin1_general_ci | | No |

Database Schema

Example of a Model-to-Model Relation



Bidirectional Model Transformation Properties



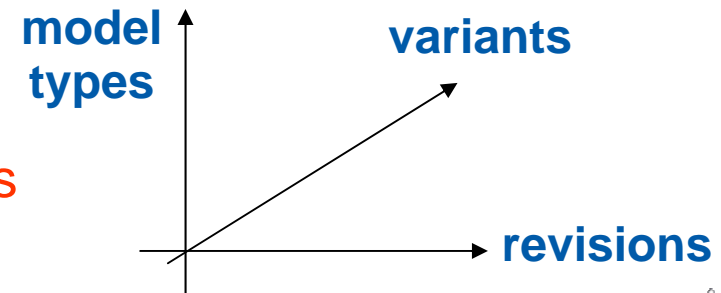
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We have to cope with

- Partial mappings (on model and element level)
- m-to-n mappings (on model and element level)
- Nondeterminism (on model level)
- Loss of information (irrelevant data for transformation)
- Acquisition of information (data generated by transformation)

We would like to guarantee (sometimes)

- correctness, hippocraticness, undoability, invertibility
- totality, acceptability, stability, forgetfulness, bijectivity
- **minimality of changes**
- **preservation of recent changes**
- **consistent reconciliation of update conflicts**
- ...





What else ?

Multi-Directional Transformations for $n > 2$ models

- Model weaving with more than TWO models
- Multi-Domain Grammars
- Multi-View-Point Specifications

Interaction of Views and Model Transformations

- View definitions are model transformations
- model transformations use overlapping? Views

Composition of Bi-Model Transformations

- Basic types of transformations:
 canonizer [Foster], ... synchronization operators [Czarnecki]
- Families of composition operators:
 ... (semantics definition for recursion)



Create a small list of
**major research challenges for
multi-directional transformations**

