

CQA: Metadata

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Schematic discrepancies

The information in the **schema** of one database may correspond to the information in the **instance** of another database.

Postulates

- ① the same constant may be a relation name, a column name and an attribute value
- ② schema elements should be first-class objects
- ③ queries may define more than one relation, each with varying number of columns.

Correspondences

- attribute value \iff relation name
- attribute value \iff column name
- column name \iff relation name

A successor of SchemaSQL [LSS01].

Features

- **metavariables**, ranging over relation and column names
- dynamically varying relation schemas (INTO, ON)

Database schemas

DA: Exams(Sid,Exam,Grade)

DB: Theory(Sid,Grade), AI(Sid,Grade), Systems(Sid,Grade)

DC: Students(Sid,Theory,AI,Systems)

Attribute values \iff relation names

DA2DB

```
select E.Sid as "Sid", E.Grade as "Grade"
into E. Exam
from DA.Exams as E
```

DB2DA

```
select T.Sid as "Sid", R as "Exam", T.Grade as "Grade"
into "Exams"
from DB :R as T
```

Attribute values \iff column names

DA2DC

```
select E.Sid as "Sid", E.Grade on E.Exam
into "Students"
from DA.Exams as E
```

DC2DA

```
select C.Sid as "Sid", A as "Exam", C.A as "Grade"
into "Exams"
from DC:R:A as C
where R="Students" and A <> "Sid"
```

FISQL queries

Semantics

- a generalization of SQL semantics
- metavariables range over relation and column names
- output: special treatment for dynamic schemas

FIRA

- extension of relational algebra
- operators map federated databases to federated databases
- new operators: partition, transpose,....

FISQL can be translated to FIRA and vice versa.



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