Relational Model

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Relational Model

The Relational Model:

- Data model on which most DBMS implementations are based.

- Very simple: Everything is a relation ($\approx$ table).

- Simplicity $\Rightarrow$ eases implementation of DBMSs. Close to physical representation of data.

- Powerful queries still possible.

Note: Relational model $\neq$ Entity-Relationship model.

There are standard ways to convert from the E-R model (used for conceptual modelling) to the relational model (used for physical modelling).

Relations

Relation ≈ table

Relation schema

- Fields (= attributes = columns).

- Field names, field domains

Relation instance

- Set of tuples (= rows = records).

Theory: Relation is set of tuples

Reality (actual DBMSs):   Relation is multi-set of tuples

Relational database schema = collection of relation schemas.

Constraints

- Keys

    Set of fields unique for each tuple in relation.
    Minimal.

- Foreign keys

    Set of fields of one relation related to a similar set of fields in another relation. For any value of fields appearing in first relation, some tuple in the other relation must contain the same values.

- Arbitrary types of constraints

    Can be specified by queries. Later.

Conversion Rules

Conversion from E-R Model to Relational model.

- Entities

- Relationships
    - Many-to-many
    - One-to-many/one

- Weak entity sets

- ISA-hierarchies

- Aggregations