Relational Model

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Relational Model

The Relational Model: [Codd, 1970]

- 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.

Relations

A Relation (≈ a table) is a schema + an instance:

Relation schema:

- Set of fields (= attributes = columns).
- Fields have names and domains (= types).

Relation instance:

- Set of tuples (= rows = records) currently stored.

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

Relational database (schema) = collection of relations (schemas).

Constraints

Restrictions on the relation instances allowed to be stored.

- Keys

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

- Foreign keys

  Set of fields of one relation related to a corresponding set of fields forming a key 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.

Constraints are considered part of schema (relation schema when a single relation is involved, database schema otherwise).