CS2102

Database Systems

AY2022/23 Semester 2

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Contents

Part I

Relational Model

Data in **relational databases** are stored in **relations** (tables). Column headers are **attributes**, and rows are **tuples**.

The **degree** is the number of columns, and the **cardinality** is the number of rows.

The **domain** of an attribute A_i, denoted as $\mathrm{dom}(A_i)$, is the set of all possible *atomic* values for A_i. `NULL` is an additional special value for unknown or invalid values.

keys

A **superkey** is a subset of attributes that uniquely identifies a tuple. A **key** is a *minimal* superkey.

The **candidate keys** is the set of all keys for a relation, of which one is selected as a **primary key**.

Primary key values must be non-`NULL`.

foreign keys

A **foreign key** is a subset of attributes of a *referencing relation* that refers to the primary key of a *referenced relation*:

(referencing attributes) ⇝ (referenced attributes)

Because the names of the attributes are not necessarily unique, each attribute is prefixed with the name of the relation, like so:

(<relation name> · <attribute name>, ...) ⇝ ...

Foreign keys must appear as a primary key in the referenced table, `NULL`, or a tuple containing `NULL`.