

Database basics

A Relation:

A table. Columns are fields (attributes) of data related to other fields on the same row (tuple).

Primary key:

Identifies the row of a table. Cannot be duplicated.

The primary key is what the table is all about: what are the rows?

Candidate primary key:

Any attribute(s) which together would serve as the primary key.

Database basics

First normal form:

One piece of information per column. No repeated rows.
(this is really just a relation, ie, a table that is a relation is in 1NF)

Third normal form:

Each column depends on the primary key of the table

Second normal form:

Each column depends on the entire primary key

Practical result of the first 3 normal forms:

- 1) One piece of information in a column (1NF)
- 2) Do not repeat data unnecessarily (2&3 NF)

Database basics

Cardinality of relationships:

one to one

one to many

many to many

Tables needed:

One to one relationship can be stored in a single table

One to many requires two tables

Many to many requires three tables

Database basics

Multiple tables

Foreign key:

Links one table to Primary Key of another table.

Associative table

Joins two sets of information in a many:many relation.

Join:

Reassembling information from multiple tables using foreign keys.

Joining two tables with R tuples in one, S in the other, produces a new table with $R \times S$ tuples.

SQL:

Structured query language, a programming language designed for joining tables.