

Database design

SQL Reference

Relationships & ER diagrams

Tables connect through relationships 关系. One-to-many 一对多 is the most common: one class has many students. Many-to-many 多对多 needs a join table 连接表 in the middle. An entity-relationship diagram 实体关系图 (ER diagram) draws each entity 实体 as a box and each relationship as a line.

Relationship	Example
one-to-one	a person and their passport
one-to-many	a class and its students
many-to-many	students and clubs

Normalisation

Normalisation 范式化 organises tables to avoid redundancy 冗余 (the same data repeated) and the update mistakes it causes. The first three normal forms 范式:

- **1NF**: every cell holds one atomic 原子 value —no lists inside a cell.
- **2NF**: no column depends on only part of a composite key 复合主键.
- **3NF**: no column depends on another non-key column.

Unnormalised (bad)	Normalised (better)
student(name, club1, club2)	student(name) + membership(student, club)