

Relationship Constraints

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Constraints on a relationship type limit the possible combinations of entities that may participate in its relationship set — determined by the Universe of Discourse (UoD), not chosen arbitrarily. Introduced in [2026-02-23-conceptual-database-design-and-the-er-model¹](#); see [er-diagram-notation²](#) for the full symbol legend.

Cardinality ratio

Specifies the number of relationship instances an entity can participate in.

Ratio	Meaning
1:1	Both entities can participate in only one relationship instance
1:N	One entity can participate in many relationship instances (the “1” side, only one of the “N” side per instance)
N:1	Same relationship, viewed from the other side
M:N	Both entities can participate in many different relationship instances

Example: `EMPLOYEE WORKSFOR DEPARTMENT` — “each department can have any number of employees, but an employee can work for at most one department” is N:1 (N on the `EMPLOYEE` side, 1 on the `DEPARTMENT` side).

¹[courses/infos1200/2026-02-23-conceptual-database-design-and-the-er-model.pdf](#)

²[courses/infos1200/er-diagram-notation.pdf](#)

Participation constraint (existence dependency)

Indicates whether an entity's existence *depends* on its relationship to another entity — i.e. whether every instance of the entity type must participate in at least one relationship instance.

- **Total participation** (double line in the diagram) — every entity instance *must* participate. E.g. “every employee must work for a department” — EMPLOYEE has total participation in WORKSFOR.
- **Partial participation** (single line) — an entity instance is *not* required to participate. E.g. “every employee can manage 0 or more departments” — EMPLOYEE has partial participation in MANAGES.

Weak entities

An entity type with no key attribute of its own is a **weak entity** — it can only be identified uniquely by combining the primary key of its **owner entity** with its own **partial key** (underlined with a dotted line). The relationship linking a weak entity to its owner is the **identifying relationship**, and the weak entity always has **total participation** in it (it can't exist without its owner). Both the weak entity box and the identifying relationship diamond are drawn with double lines. A weak entity can have two (or more) owner entity types, in which case the identifying relationship is n-ary rather than binary.