**Relational Data Modeling - Cardinality**

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1 - About

The cardinality is way to define the [relationship](https://datacadamia.com/data/type/relation/modeling/relationship) between two [relation](https://datacadamia.com/data/type/relation/relation) in a data model :

* [one-to-one](https://datacadamia.com/data/type/relation/modeling/one-to-one)
* optional on one side one-to-one
* [one-to-many](https://datacadamia.com/data/type/relation/modeling/one-to-many)
* [many-to-many](https://datacadamia.com/data/type/relation/modeling/many-to-many)
* …

Cardinalities further describe a [join](https://datacadamia.com/data/type/relation/sql/join) between 2 entity by stating how many [rows](https://datacadamia.com/data/type/relation/row) in one [relation](https://datacadamia.com/data/type/relation/relation) will match rows in an another (It defines the minimum and maximum number of occurrences of one entity for a single occurrence of the related entity).

Cardinality is not a number; it is a range --*Iordan Iotzov*

2 - Articles Related

* [Dimensional Data Modeling - Fact Table](https://datacadamia.com/data/type/cube/modeling/fact_table)
* [Logical Data Modeling](https://datacadamia.com/data/modeling/modeling)
* [SQL - Joins (Home)](https://datacadamia.com/data/type/relation/sql/join)
* [Business - Rule](https://datacadamia.com/business/rule)
* [Relational Data Modeling - Entity-Relationship Diagram (ERD)](https://datacadamia.com/data/type/relation/modeling/entity_relationship_diagram)
* [Relational Data Modeling - Relationship](https://datacadamia.com/data/type/relation/modeling/relationship)
* [JPA - Entity Annotations](https://datacadamia.com/jpa/annotation)
* [Dimensional Data Modeling - Degenerate Dimension of Fact dimension (i.e. event/header entity)](https://datacadamia.com/data/type/cube/modeling/degenerate)
* [Python - Set](https://datacadamia.com/lang/python/type/set)
* [Oracle Database - Rows (of Card as Cardinality for 9i)](https://datacadamia.com/db/oracle/cardinality)
* [More ...](https://datacadamia.com/data/type/relation/modeling/cardinality?do=backlink)

3 - The cardinality between two tables define the relationship

The cardinality of one data table known as :

* left table
* inner table
* of local table

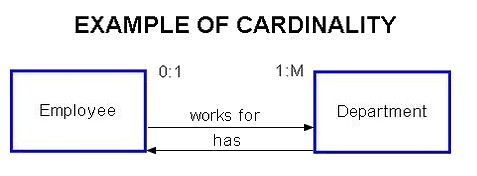
with respect to another data table known as :

* right table
* outer table
* of remote table

define the type of [relationships](https://datacadamia.com/data/type/relation/modeling/relationship).

| **Left table cardinality** | | **Right table cardinality** | | **Type of relationship** |
| --- | --- | --- | --- | --- |
| **Min** | **Max** | **Min** | **Max** |  |
| 1 | 1 | 1 | 1 | one-to-one |
| 0 | 1 | 1 | 1 | optional on one side one-to-one |
| 0 | n (or \*) | 0 | n (or \*) | optional on both sides many-to-many |
| 1 | 1 | 1 | n (or \*) | one-to-many |

* Min = Minimum count of row
* Max = Maximum count of r

[](https://datacadamia.com/_detail/dw/data_quality/cardinality.jpg?id=data%3Atype%3Arelation%3Amodeling%3Acardinality)

4 - Cardinality Symbol

| **Cardinality** | **Min Instance** | **Max Instance** | | **Graphic Notation** |
| --- | --- | --- | --- | --- |
| Exactly one | 1 | 1 | |  |
| Zero or one | 0 | 1 | |  |
| One or more | 1 | many (>1) | |  |
| Zero, one, or more | 0 | many (>1) | |  |
| More than one | >1 | >1 | |  |
| **Cardinality** | **symbol Example** | | **Description** | |
| Arrow |  | | Arrow indicates the “one” direction of the join. If cardinality is 1,1 then an arrow head is shown at each join end. | |
| Parity |  | | Crow's foot indicates the “many” end of the join. If cardinality is 1,1, then a straight line is shown. | |
| 1,N |  | | Cardinality symbol Example Description Cardinality is shown as a ratio at each end of the join. | |

5 – Visualization