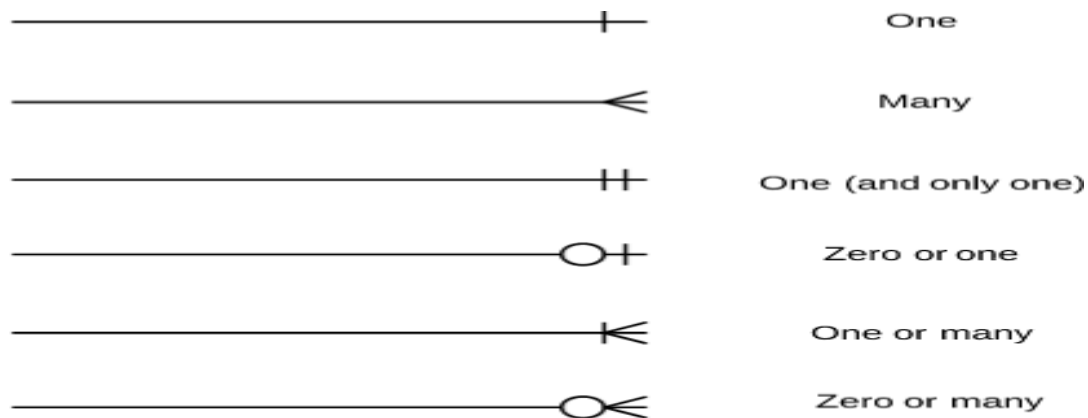# Cardinality in DBMS

Cardinality refers to the relationship between two tables or we can say the **number of times an entity of an entity set participates in a relationship**

One to One

A single row of first table associates with single row of second table or a single row of the second table associate only with the single row of the first table or One entity from entity set X can be associated with at most one entity of entity set Y and vice versa.

For example, a relationship between person and passport table is one to one because a person can have only one passport and a passport can be assigned to only one person.
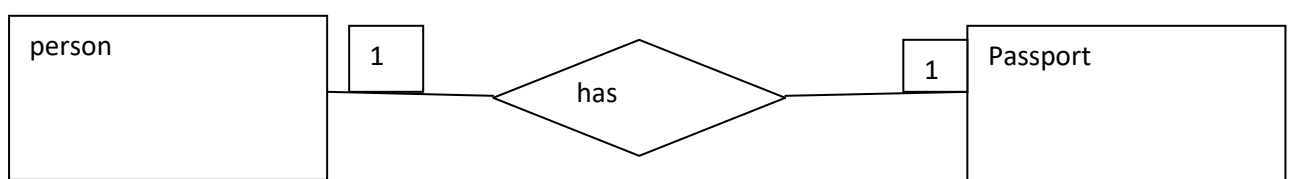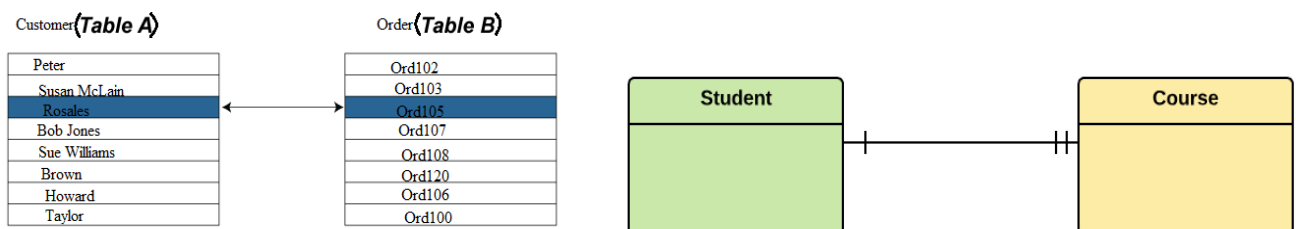
One-to-many:

It is used to create a relationship between two tables. Any single rows of the first table can be related to one or more rows of the second tables, but the rows of second tables can only relate to the only row in the first table
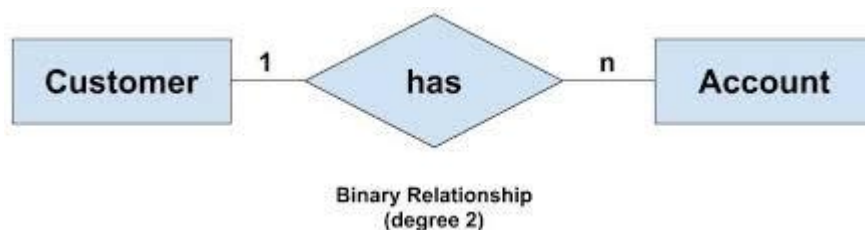
One entity from entity set X can be associated with multiple entities of entity set Y, but an entity from entity set Y can be associated with at least one entity.

example, relationship between customer and order table is one to many because a customer can place many orders but a order can be placed by a single customer alone.

a student can take only one course but one course can be taken by many students.
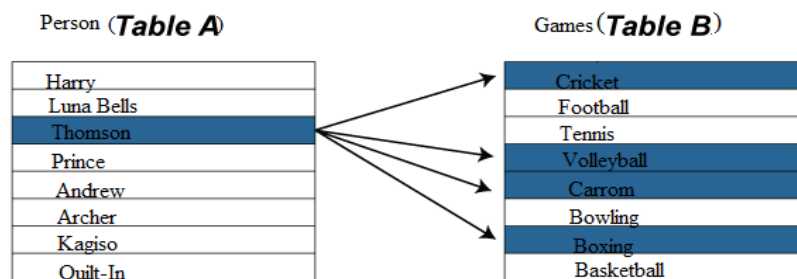
A car manufacturer makes multiple models of the cars, but a same car model can't be manufactured by two manufacturers.
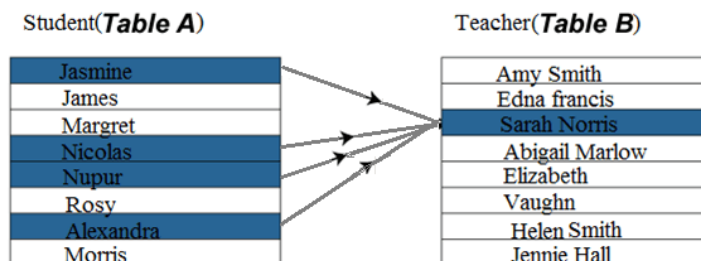

Binary Relationship
(degree 2)

Many to One

Many rows of first table associate with a single row of second table

More than one entity from entity set X can be associated with at most one entity of entity set Y. However, an entity from entity set Y may or may not be associated with more than one entity from entity set X.

 For example, relationship between student and university is many to one because a university can have many students but a student can only study only in single university at a time.

Student(**Table A**)

Student(Table A)
Jasmine
James
Margret
Nicolas
Nupur
Rosy
Alexandra
Morris

Teacher(**Table B**)

Teacher(Table B)
Amy Smith
Edna francis
Sarah Norris
Abigail Marlow
Elizabeth
Vaughn
Helen Smith
Jennie Hall

Student —n— Enrolled in —1— Course

Many to Many

Many rows of first table associate with many rows of second table. For example, relationship between student and course table is many to many because a student can take many courses at a time and a course can be assigned to many students.

It is **many to many** relationships that create a relationship between two tables. Each record of the first table can relate to any records (or no records) in the second table. Similarly, each record of the second table can also relate to more than one record of the first table. It is also represented an **N: N** relationship.

For example, there are **many** people involved in each **project,** and every person can involve more than one project.