

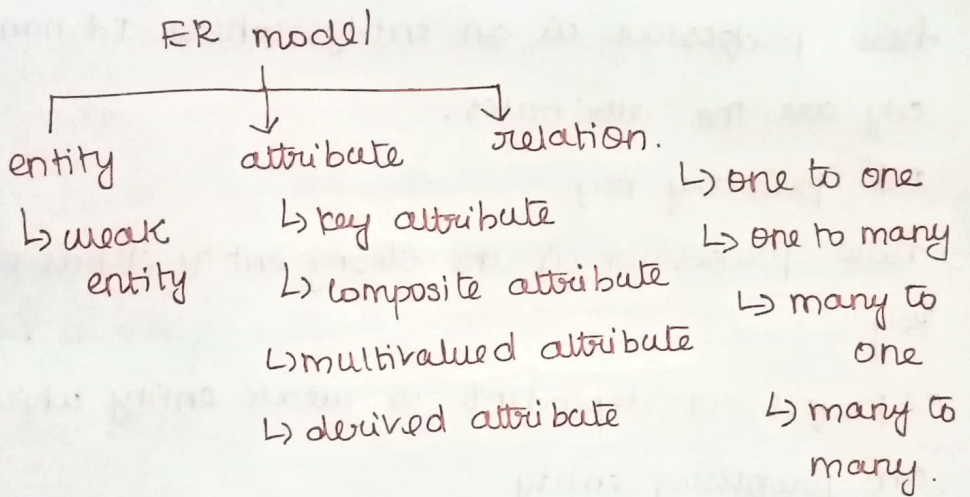
# Entity relationship model

ERM is the conceptual model which represents the information structure of a problem domain in terms of entities and relationships.

It is the graphical representation of real world problem.

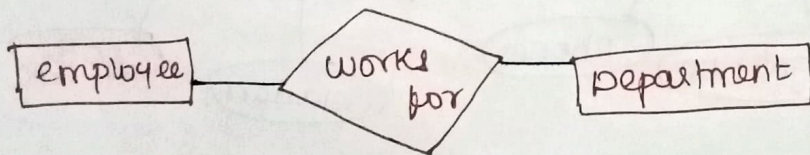
This is the high level data model used to define data elements and relationship for a specified system.

This ER model develops a conceptual design for the database.



Entity - An entity may be any object, class, person or place. Entity is represented as "rectangles".

Ex: manager, product, employee, department etc.,

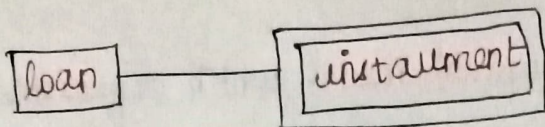


## weak entity

↳ entity depends on another entity - weak entity

↓  
does not have key attribute of its own.

→ This is represented as "double rectangle".



strong entity

→ Has the primary key - represented as single rectangle

Ex: Professor

Id	Name	city
01	TOM	Sydney
02	David	Brisbane
03	mark	perth

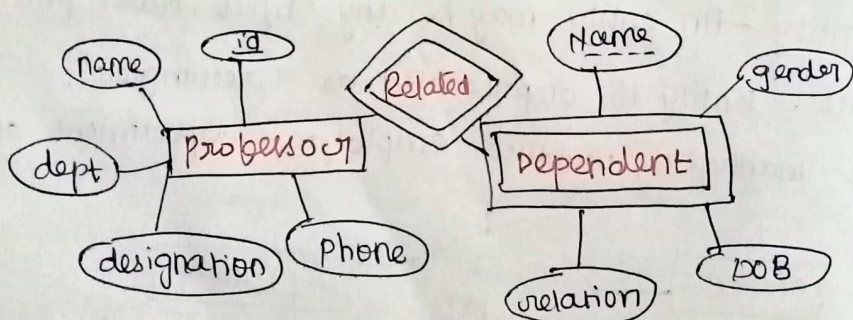
here professor is an entity, where Id, name and city are the attributes.

Id - primary key.

→ here professor is the strong entity, it has primary key

→ professor dependent is weak entity which depends on professor entity.

Ex:-



→ here strong entity - Professor has primary key which is underlined

→ dependent - weaker entity - does not have any primary key. Name - partial key which is denoted as "dotted line".

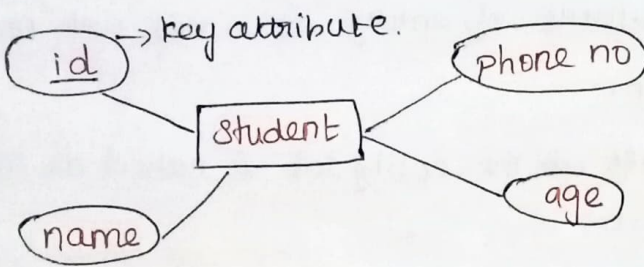


## Attributes

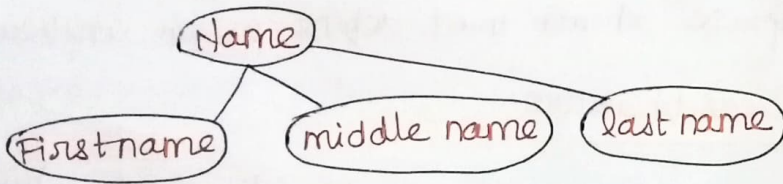
- used to describe the property of an entity.
- Eclipse is used to represent an attribute.

Ex: id, age, doB, phone number etc.

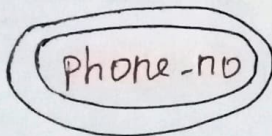
Key attributes: used to represent main characteristics of an entity. This is the primary key. represented by an ellipse with underlined text.



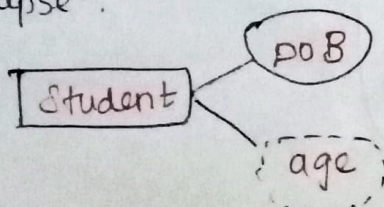
Composite attributes - An attribute that composed of many other attributes called composite attributes. This is represented using ellipse.



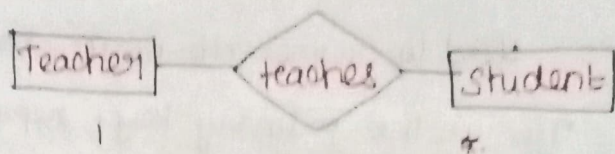
Multivalued attributes - An attribute have more than one value. Double oval is used to represent the multivalued attributes.



Derived attributes - An attribute can be derived from other attribute called derived attribute. It is represented by "dashed ellipse".



A relationship is used to describe the relation b/w entities. Diamond or rhombus is used to represent the relationship.



one to one relationship.

when one instance of entity associated with one entity with relationship.

set of entities in the entity set is called as the "extension".

→ Entity set need not to be disjoint.

→ Relationship set - set of relationship of the same type.

### Constraints

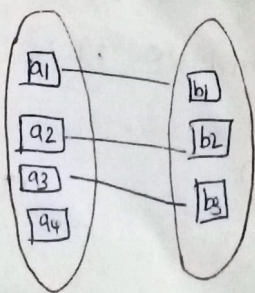
ER enterprise schema must define certain constraints.

### mapping cardinalities

Mapping cardinality or cardinality ratio which express the number of entities to which another entity can be associated via the relationship set.

↳ It is most useful in describing the relationship set. (binary relationship set).

### One to one:

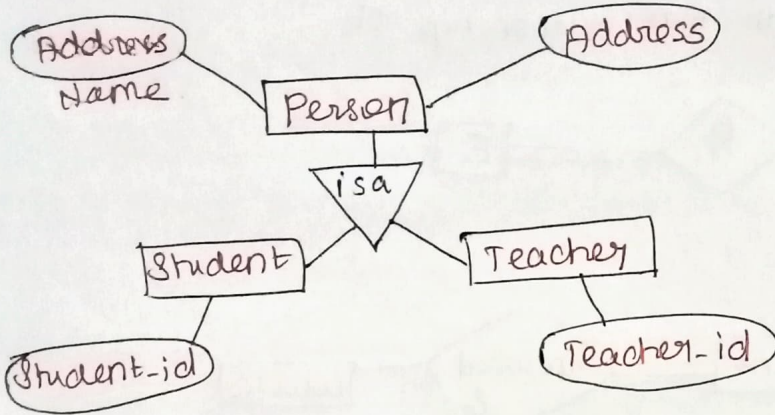




## Generalization

This collects the common features of multiple entities to form a new entity.

Example:



As here student and teacher both has common attributes such as name and address. So, new entity called student is created which has name and address.

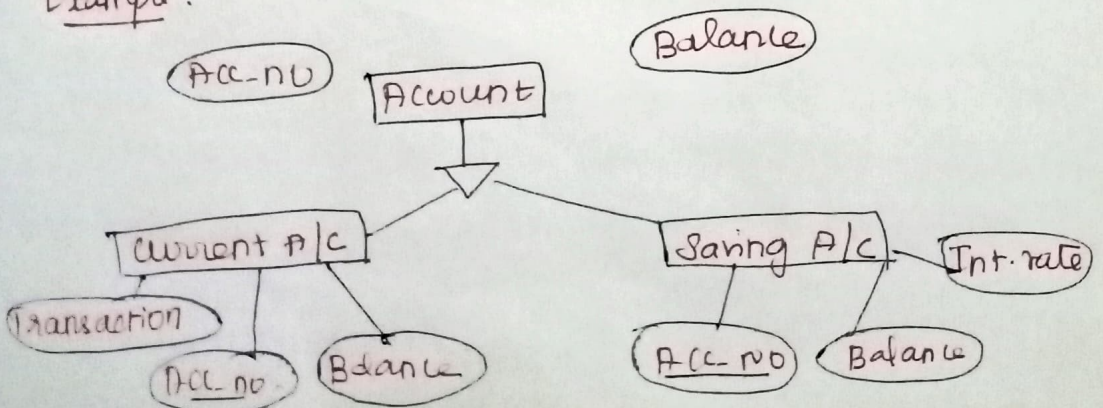
## Specialization

Specialization divides the entity to form multiple new entities that inherit some feature of the splitting entities.

This is based on requirement of types or classes to more specific ones.

-> Entities are divided into sub entities based on their characteristics.

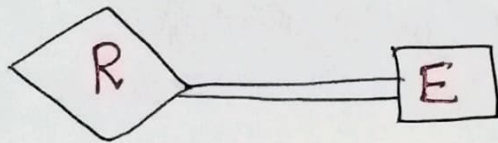
Example:



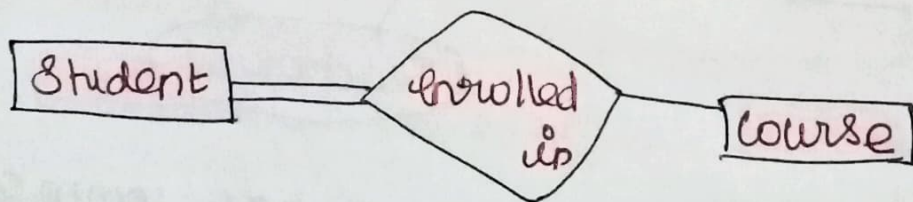
## Participation constraints:-

total participation constraints.

This specifies that each entity in the entity set must compulsorily participate in at least one relationship instance in that relationship set.



Ex:-



=- indicates that each student should enroll in at least one course.