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## DBMS Experiment - I

Aim: To identify the case study and detail Statement of problem design an Entity-Relationship (ER) / Extended Entity-Relationship (EER) Model.

### Theory:

ER Model: ER Model is used to model the logical view of the system from data perspective which consists of entity, entity type & entity sets.

Entity: An entity may be an object with a physical existence - a particular person, car, house or employee or it may be an object with conceptual existence - a company, a job, or a universal course.

An Entity is an object of Entity type and set of all entities is called as entity set.

Eg: E<sub>1</sub> is entity having entity type student and set of all students is called entity set.

Student

← Entity type

E1

E2

E3

← Entity set

**Attribute(s) :** Attributes are the properties which define the entity type. For example, Rollno, name, DOB, Address, Mobileno are the attributes which defines entity type Student.

In ER-diagram, attribute(s) is represented by an oval.

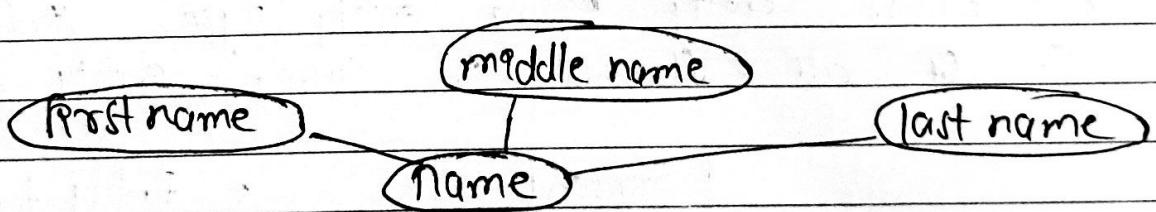
### Attribute

Attributes are further classified as :

(i) **Key attribute :** The attribute which uniquely identifies each entity in the entity set is called key attribute. For example Rollno will be unique for each student. In ER diagram it is represented as

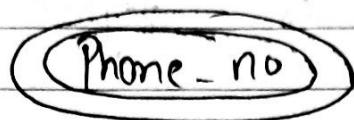
Roll-no

(ii) **Composite attribute :** An attribute composed of many other attribute is called as composite attribute. For example name attribute of student consists of first name, middle name, last name. In ER diagram it is represented as



(iii) **Multivalued Attribute :** An attribute consisting more than one value for given identity. For example, phone\_no .

In ER diagram, multivalued attribute is represented by double oval

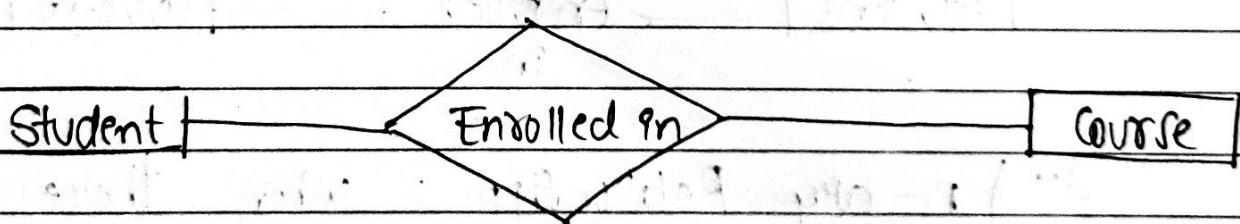


(iv) Derived attribute : An attribute which can be derived from other attributes of the entity type is known as derived attribute. eg: Age (can be derived from DOB). In ER diagram it is represented as

Age

• Relationship type and relationship set

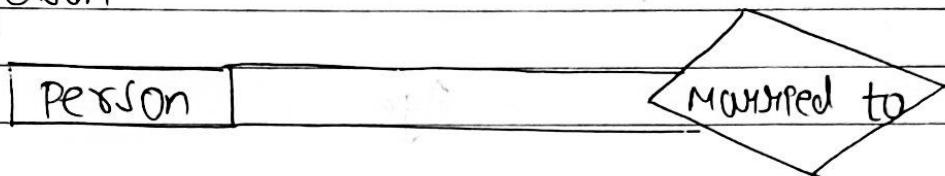
A relationship type represents the association between entity types. For example "Enrolled in" is relationship type that exists between entity type student and course. In ER diagram it is represented as



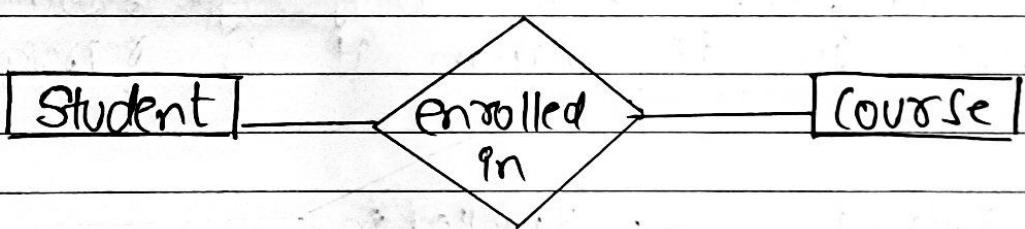
A set of relationships of same type is known as relationship set.

Degree of relationship set : The number of different entity sets participating in a relationship set is called as degree of a relationship set.

(i) Unary relationship : When there is only one entity set participating in relation, the relationship is called as unary relationship.  
For example : one person is married to only one person



(ii) Binary Relationship : when there are two entities set participating in a relation, the relationship is called as binary relationship.  
For example : student enrolled for course

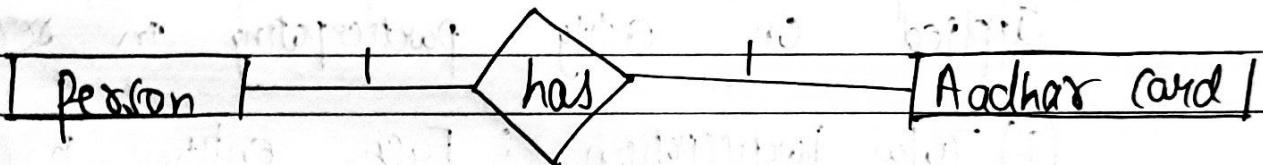


(iii) n-ary Relationship : when there are n entities set participating in a relation, the relationship is called as n-ary relationship.

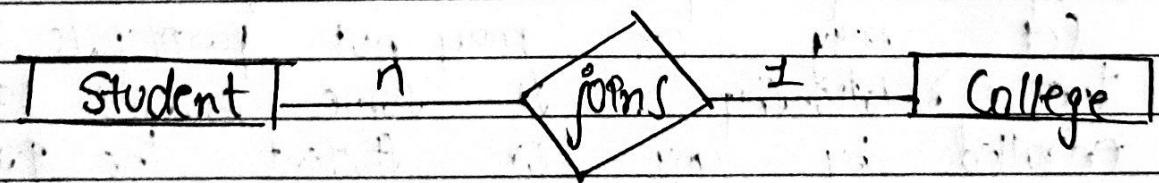
• Cardinality: The number of times an entity or an entity set participates in a relationship set is known as cardinality.

Cardinality can be of different types:

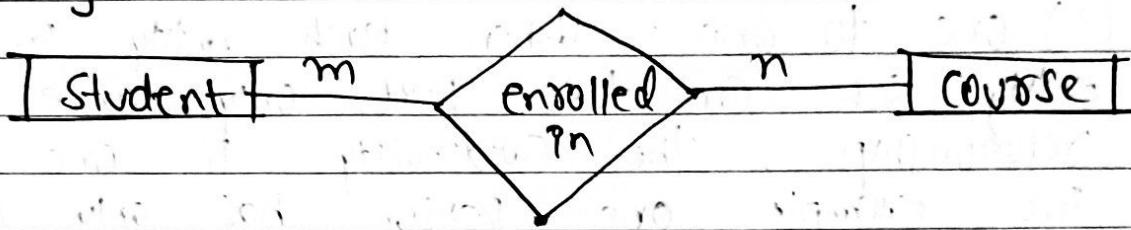
(i) one to one: When each entity in each entity set can take part only once in the relationship, the cardinality is one to one. For example one person has only one Aadhar card.



(ii) Many to one: When entities in one entity set can take part only once in relationship set and entities in other entity set can take part more than once in relationship set. For example many students can join 1 college so cardinality will be n to 1.



(iii) Many to many : When entities in all entity sets can take part more than once in the relationship. Cardinality is many to many. For example: many students can enroll for many courses. So the relationship will be many to many.

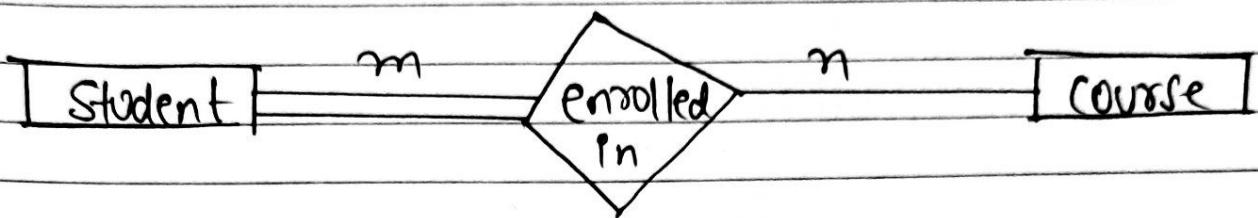


• Participation Constraint : participation constraint is applied on entity participating in relationship set

(i) Total participation : Each entity in the entity set must participate in relationship. If each student must enroll in a course the participation of student will be total. Total participation is shown by double line in ER diagram.

(ii) Partial participation : The entity in the entity set may or may not participate in the relationship. If some courses are not enrolled by any student the participation of course will be partial.

The diagram depicts the 'enrolled in' relationship set with Student entity set having total participation and course entity set having partial participation.

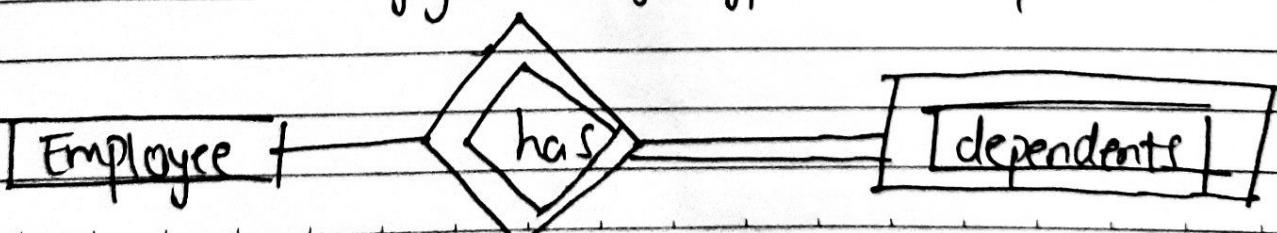


- Weak Entity Type and Identifying Relationship.

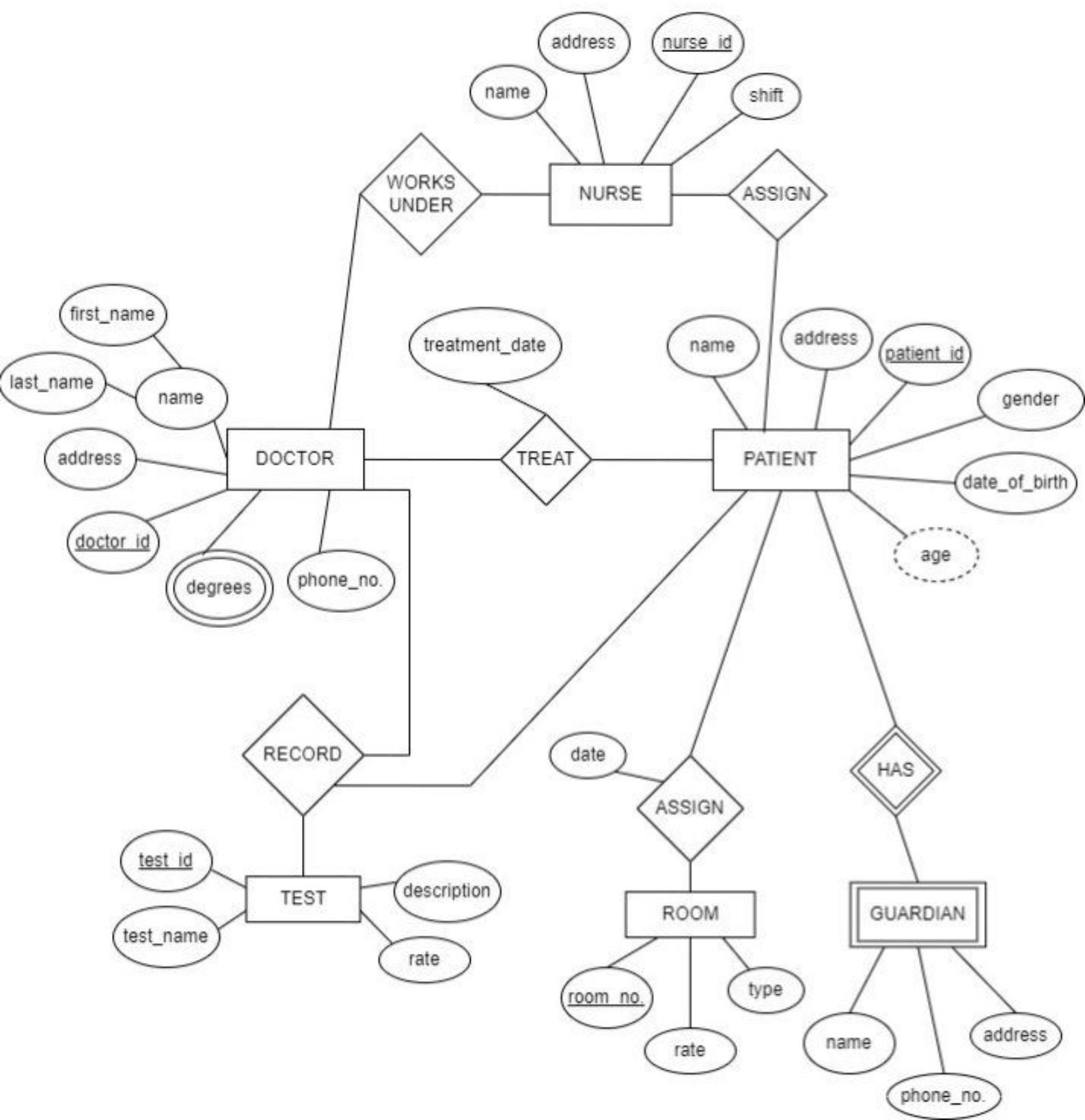
An entity type has a key attribute which uniquely identifies each entity in entity set. But there exist some entity type for which key attribute can't be defined. These are called weak entity type.

A weak entity type is represented by double rectangle. The participation of weak entity type is always total.

For example : A Company may store the information of dependents of employee but the dependents don't have existence without employee so dependent will be weak entity type & employee will be identifying entity type or dependent



# CASE STUDY: HOSPITAL MANAGEMENT SYSTEM



Conclusion : We have understood the various concepts used in ER - model and made the ER diagram for hospital management successfully.