

Vivekanand Education Society's Institute of Technology  
Department of Computer Engineering



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Name of the Course : Database Management System Lab

Year/Sem/Class : S.E. / Sem IV / D7A

Code: CSL402

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Exp No.: 01	Title: <u>To identify the case study and statement of problem and draw (ER) model using draw.io</u>	
DOP: 17/02/22	DOS: 13/03/22	
Grade:	Course Outcomes:	Signature:

## AIM:

Identify the case study and detail statement of problem and draw entity relationship (ER)/ Extended Entity Relationship (EER) model using draw.io.

## Theory:

(A) This system mainly focuses to reduce the headache of maintaining the record of students and teacher's related documents and to reduce the cumbersome job of maintaining several record it will eliminate the delays in the fees staties and free updating of the students. this system will help in maintaining the records of students. searching will become more efficient and fast in comparison to manual searching. Overall, it will reduce the cost and time of the college head in taking care of the college.

## Functional Requirements:

1. College Management System will consist of seven entities, STUDENT, DEPARTMENT, SUBJECT, FACULTY, BOOKS, EXAM, COURSE

2. Faculty members are identified by uniquely by attribute id, the other attributes are name, address and phone number. Faculty members belong in a department. Faculty members teaches

## Subjects to students

- 3 Students are identified by uniquely by id attribute which is the primary key, other attributes are name, student enrolls in a course. Students can borrow books, students are taught by faculty members.
- 4 Department is identified by uniquely by id attribute which is the primary key, other attribute is d\_name. Department handles courses, it consists of faculty members and it conducts exams.
- 5 Courses have a unique id called as c\_id and is the primary key. Courses are handled by departments.
- 6 Exams are uniquely identified with help of e\_id which is primary key. Exams are conducted by department.
- 7 Books are uniquely identified by attribute b\_id which is primary key. Books can be borrowed by students.

### B) Entity set:

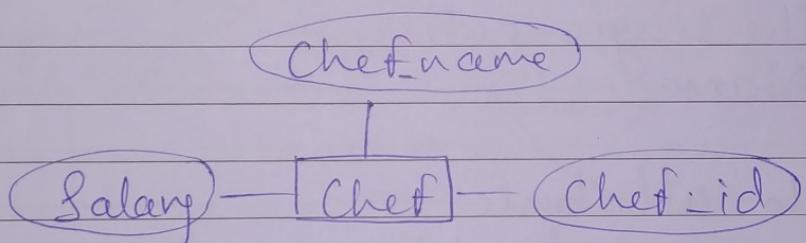
An entity is a thing that either physically or logically exists. An entity set is a set of entities which share the same properties. It is denoted by a rectangle. For eg,

In Restaurant Management System, chef is the entity which has similar properties like Name, id etc.

#### Attributes:

These are properties of an entity set. It is denoted by O.

Eg



a)

#### Key attribute (Primary key)

To identify attribute uniquely we set the key to the attribute. It is denoted by underline (-).

Eg

id is key attribute

b)

#### Multivalued attribute

Attribute having multiple values. It is denoted by O.

Eg

(Phone) is multivalued attribute as a person can have more than 1 phone no.

### c) Derived attributes

These attributes do not exist physically in the database, but their values can be derived from other attributes present in the database.

Eg

If we add Date\_of\_Birth as input, age can be derived

(1)

### d) Single valued attribute

It is an attribute which can hold a single value for the single entity.

Eg. Name

### e) Simple attribute

The attribute whose value cannot be further divided that means it is atomic in nature.

Eg, first Name

(1)

### f) Composite attribute

These attribute can be further divided into subparts

Eg

Name is a composite attribute which is divided in subparts, first name, Middle Name and Last Name

Relationship:

The association between two or different entities

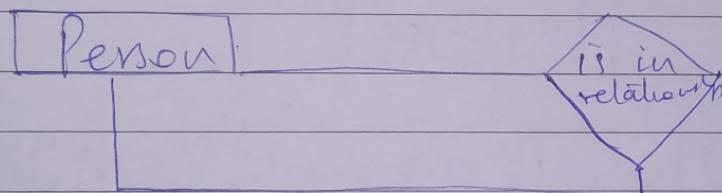
## is Relationship

### a) Unary Relationship :-

Unary Relationship exists when there is a relation between a single entity. It is also known as a recursive relationship in which an entity relates with itself.

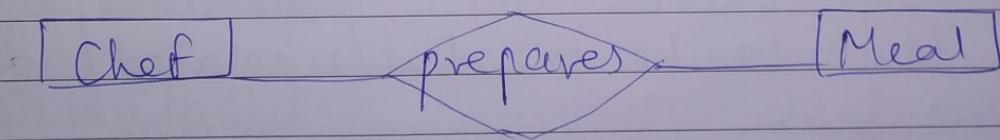
Eg

A person can be in a relationship with another person. A women who can be someone's mother. A person who can be someone's child.



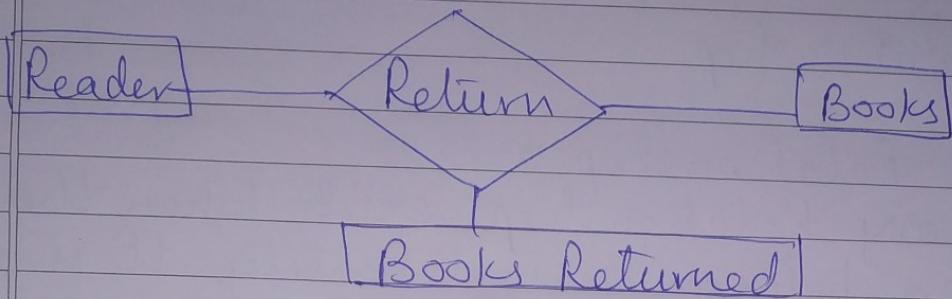
### b) Binary Relationship:

A binary relationship exists only when there is a relation between two entities. In this case the degree of relation is 2.



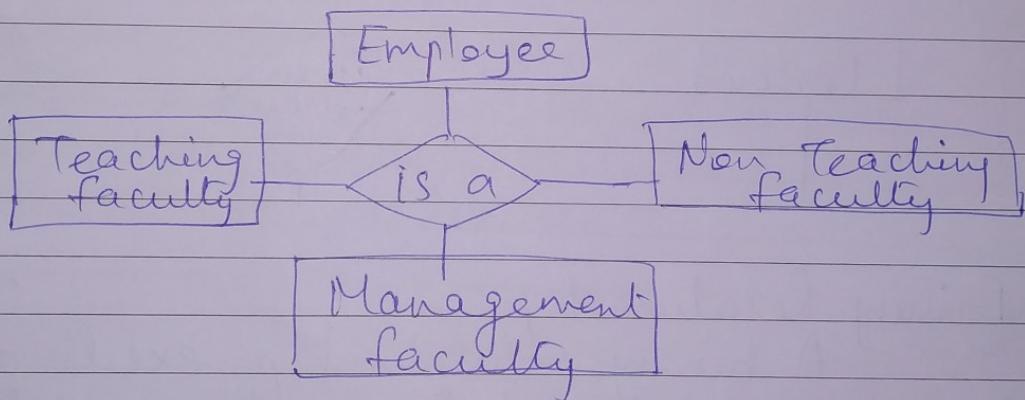
### c) Ternary Relationship:

A ternary relationship exists when there are relations between three entities. In this case the degree is 6.



d) Quaternary Relationship:-

A Quaternary Relationship exists when there are relations between four entities. In this case the degree is 8.



Constraints :

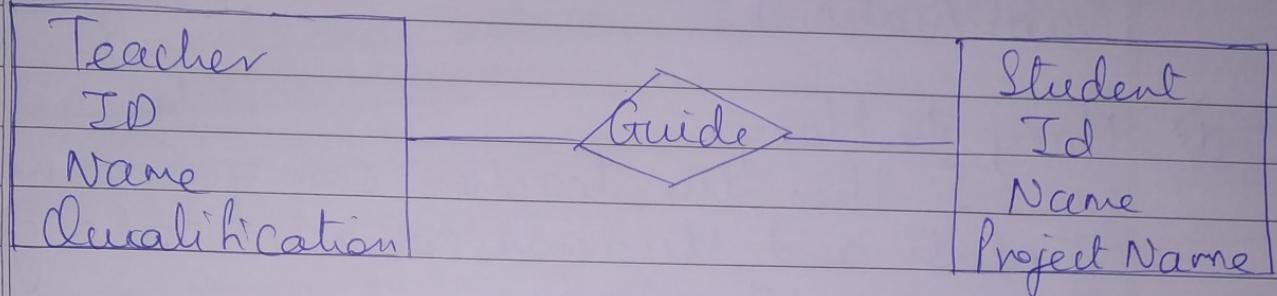
Constraints enforce limits to the data type or the data that can be inserted / updated / deleted from a table.

Mapping Cardinality :-

a) One to One:

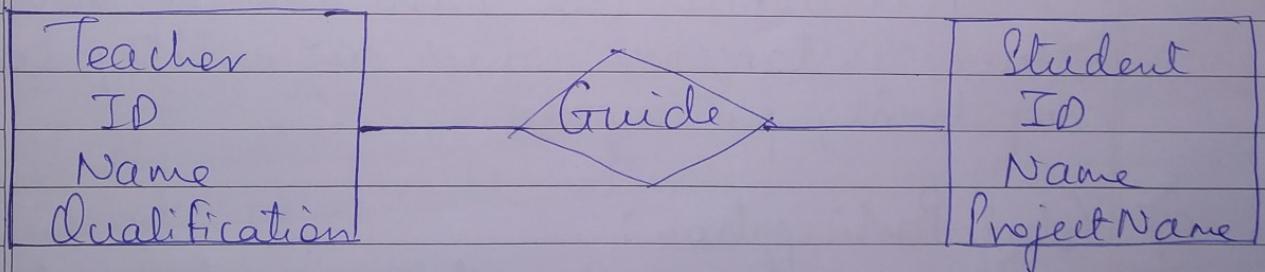
In this, directed lines from relationship guide are drawn towards both entity sets.

teacher and student. The teacher can guide at most one student and the student can take the guidance of almost one teacher.



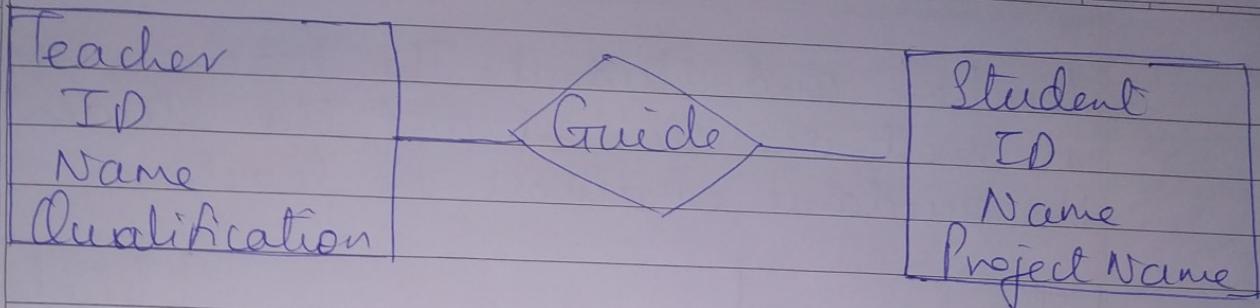
b) One to Many:

In one to many mapping cardinality, directed lines from relationship guide to entity set teacher is drawn and undirected line from relationship guide to entity set student is drawn. Teacher can guide many students but student can take guidance from almost one teacher



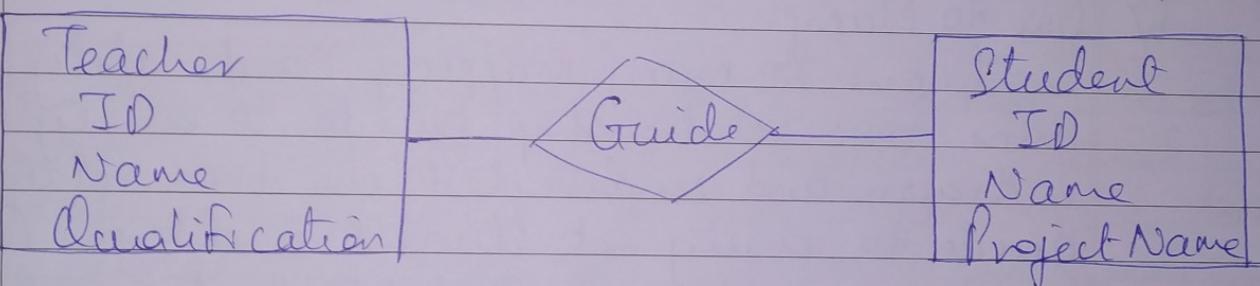
c) Many to One:

In Many to one mapping cardinality undirected line from relationship guide to entity set teacher is drawn and directed line from relationship to entity set student is drawn. In this teacher can guide at most one student but student can take guidance from many teachers



d) Many to Many:

In this, the teacher can guide many students and students can also take guidance from many teachers

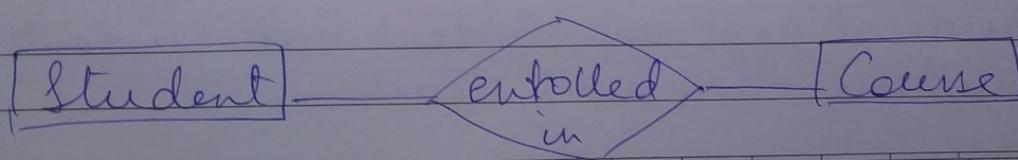


Participation Constraints:-

This defines the least number of relationships between instances in which an entity set must compulsorily participate

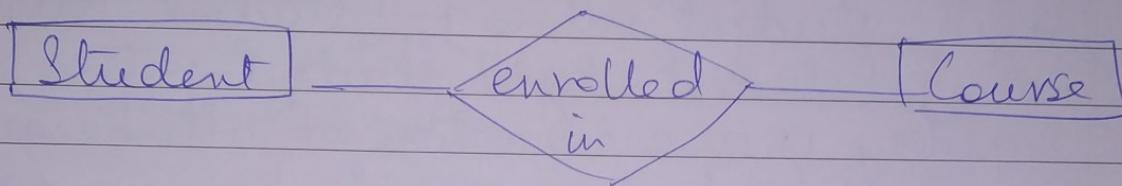
a) Total Participation:

It specifies each entity in set must compulsorily participate in atleast one relationship instance in the relationship set. Hence double line between student and enrolled signifies total participation. It specifies that each student must be enrolled in atleast one course.



### b) Partial Participation:

It specifies that each entity in entity set may or may not participate in relationship instance in that relationship set. This is represented using single line between entity set and relationship set.



Single line between entity set Course and relationship set enrolled in signifies partial participation. It specifies that there might exist Courses for which no enrollments are made.

### Key Constraints:

#### a) Primary Key:

Primary key uniquely identifies each entity in the entity set. It must have unique values and cannot hold null values.

Eg id

#### b) Super Key:

Superkey is a key which is formed by combining more than one attribute for the purpose of uniquely identifying entities.

Eg

In student database having attributes student-  
regid, student-roll no, student-name, address.

The superkeys are:

{student-regid}, {student-roll no}, {student-  
regid, student-roll no}, {student-roll no, student-  
name}, {student-regid, student-roll no, student-  
name}

Superkey is a combination of attributes so that  
the identification of records became easier

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Candidate key:

Candidate Key is formed by collection of  
attributes which hold unique values. A super key  
without redundant values is known as candidate  
key. Candidate key is also known as minimal super  
key having uniqueness property.

Eg

In student database with attributes student-  
regid, student-roll no, student-name

The candidate keys are:

{student-regid}, {student-roll no}, {student-  
regid-student-roll no}

d)

Foreign key:

A relation schema may have an attribute  
that corresponds to the primary key of another  
relation. The attribute is called foreign key

## STRINGS ENTITY:

If an entity having its own key attribute is specified then it is a strong entity. It is denoted by  in parent child relationship parent is strong entity

## WEAK ENTITY:

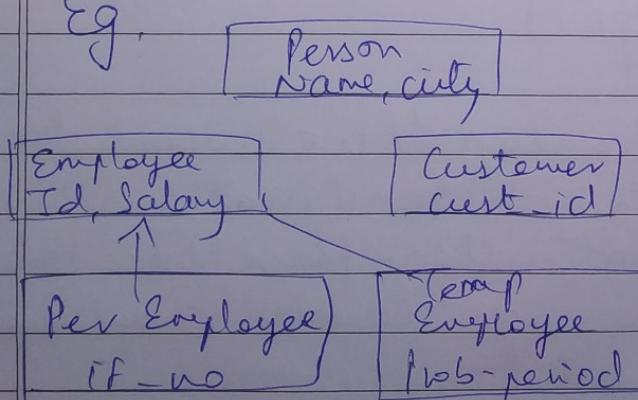
The entity that does not have any key attribute is known as weak entity. It is denoted by  child in a parent child relationship is a weak entity

## EER features:

### 1) Generalisation:

This shows top down approach process of defining a more general entity type from given entity types. Commonality can be termed as generalisation which is containment relationship that exist between higher level and one or more lower level entity set

Eg.



Employee is higher-level entity set while permanent and temporary employee are lower level entity set. Higher level is also known as super class while lower level is called as sub class

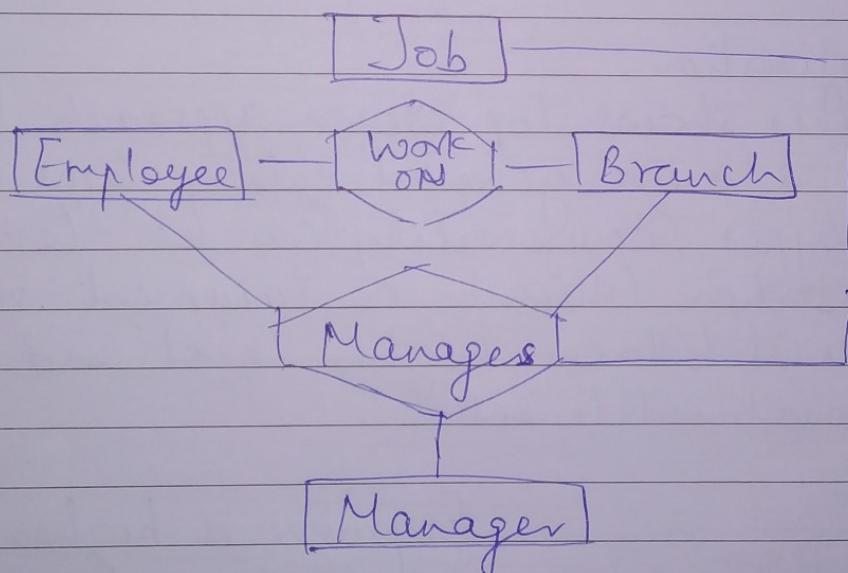
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## Specialization:

In description of customer entities, we may add new attribute like customer\_id whereas in description of employee entities we may add new attributes like employee\_id. Whereas in description of employee entities we may add new attributes like employee\_id and salary. This process of creating subgroups within an entity set is called specialization. The ----- specialization of entity person helps to distinguish whether a person is an employee or customer depending upon attributes.

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## Aggregation



To represent a relationship if we want to record for Employee, branch, job) Combinations. We can set Quatre very relationship - Here the relationships sets 'workon' and 'manages' can be combined into one single relationship set

### Conclusion:

The detailed case study and problem statement for Restaurant Management System is studied and discussed and EER diagram is successfully completed using draw.io.

