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**Class-**Bsc CS.(Entire)-II

**Semester-**III

**Subject -**Introduction to RDBMS using MySQL

# Unit 2: Introduction to Data Models & Normalization

## What is ER Diagram?

- **ER Diagram** stands for Entity Relationship Diagram
- ER diagrams help to explain the logical structure of databases
- ER diagrams are created based on three basic concepts: entities, attrib mutes and relationships.
- The purpose of ER Diagram is to represent the entity framework infrastructure.

# Why use ER Diagrams?

- Provide a preview of how all your tables should connect, what fields are going to be on each table
- Helps to describe entities, attributes, relationships
- ER diagrams are translatable into relational tables which allows you to build databases quickly
- ER Diagram allows you to communicate with the logical structure of the database to users

# Concept of Entity

- An Entity may be any object, class, person or Place. In ER Diagram, an Entity can be represented as rectangle 
  Rectangles are named with the Entity Set they represent as follow


- **Following are the types of Entity**

**1. Tangible Entity-**It is a physical object that can be touched, seen, or measured

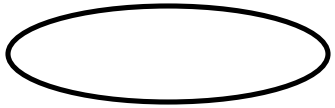
**2. Intangible Entity-** is a nonphysical object that cannot be touched, seen, or measured. For example bank Account

**3. Strong Entity Type-** Strong Entity are those entity types which has a key attribute. It is represented by a rectangle.

**4. Weak Entity-**Weak Entity type doesn't have a key attribute. A weak entity is represented by a double outlined rectangle.

# Attributes:

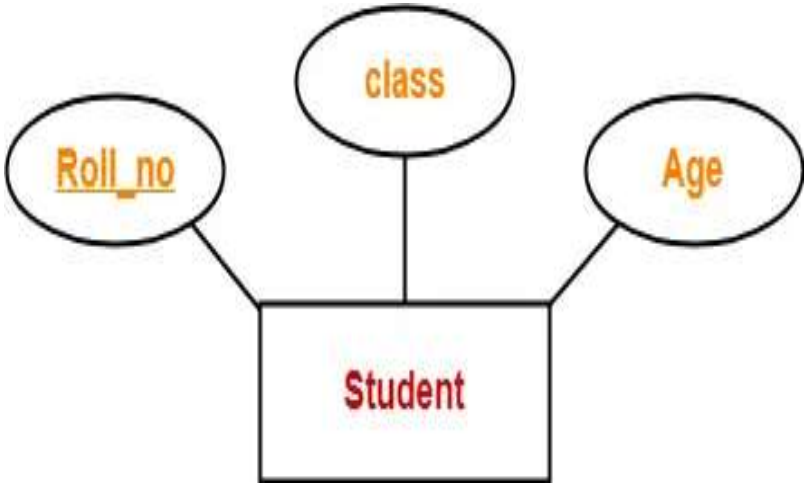
- The attribute is used to describe the property of an Entity
- An Entity set may contains any number of attributes for example consider Student is Entity and its attribute is Roll_no, Name, address, class, DOB, phone_no, email
- Attributes are represented in an elliptical shape



# Types of Attributes

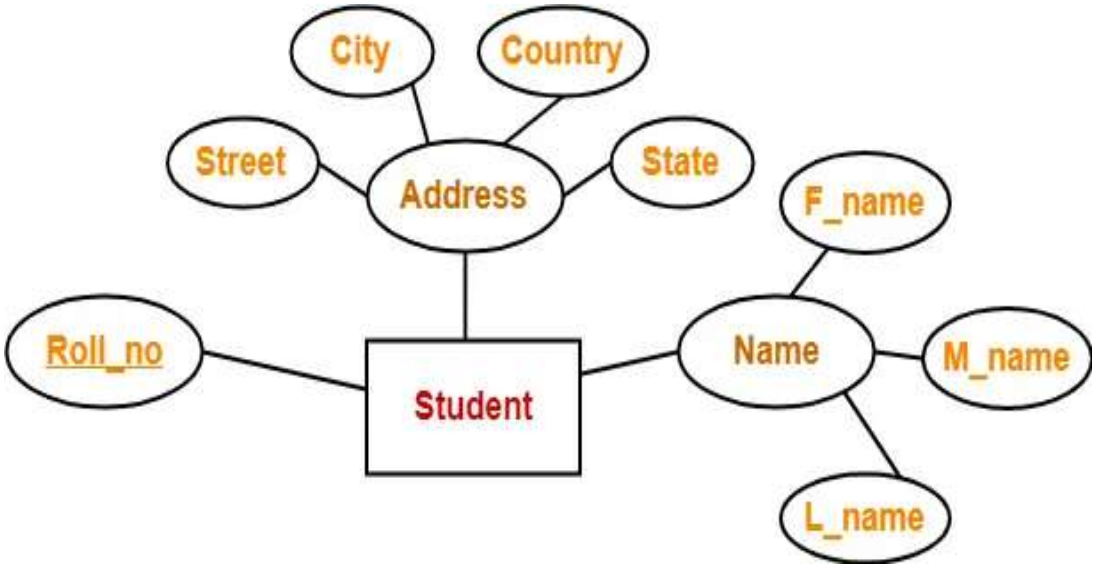
## 1) Simple Attributes

- Simple attributes are those attributes which cannot be divided further.
- It is represented by ellipse 
- For example: Rollno of a student, the id of an Employee.



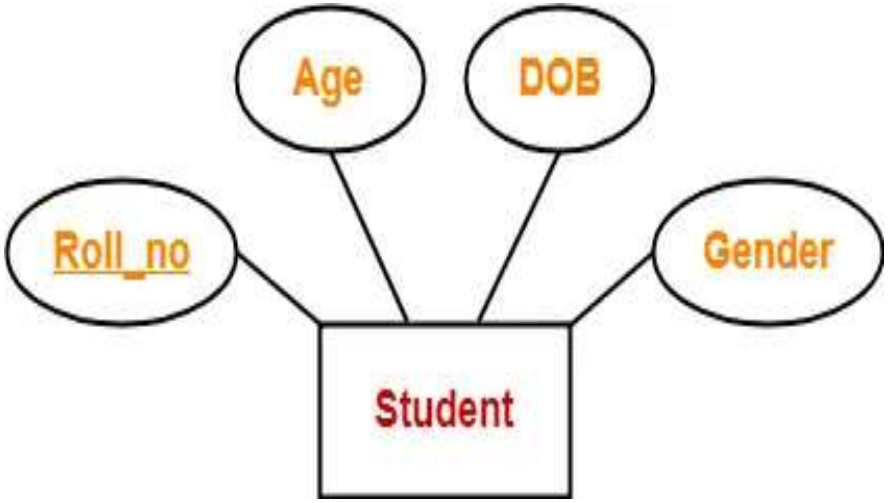
# 2) Composite Attribute

- An attribute that can be split into components is a composite attribute
- The composite attribute is represented by an ellipse and these ellipse are connected with an ellipse
- For example :In Student Entity the student Name is a composite attribute as a name is composed of other attribute such as First_Name, Middle_Name, Last_Name.



# 3. Single Valued Attributes

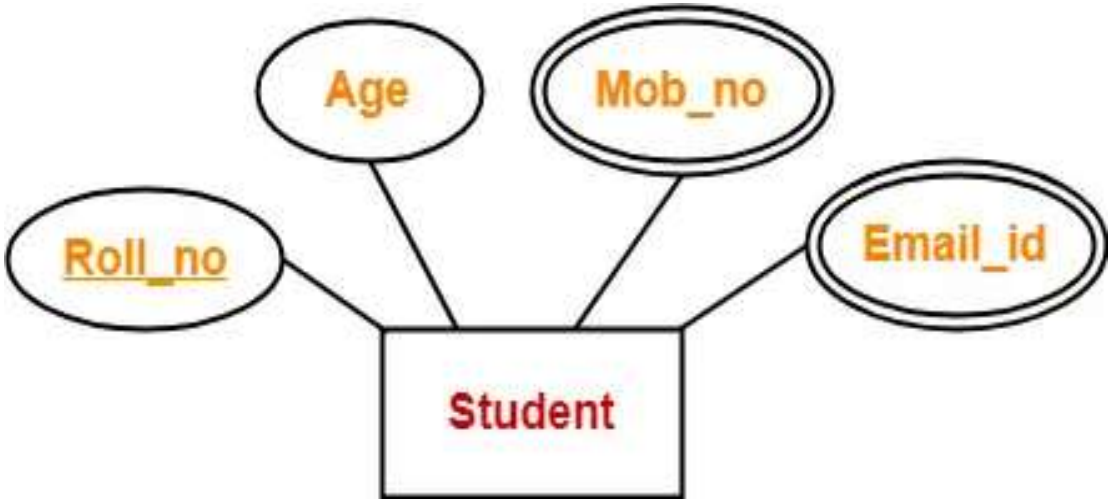
•Single valued attributes are those attributes which can take only one value for a given entity from an entity set.
•Here, all the attributes are single valued attributes as they can take only one specific value for each entity.



## 4. Multi Valued Attributes

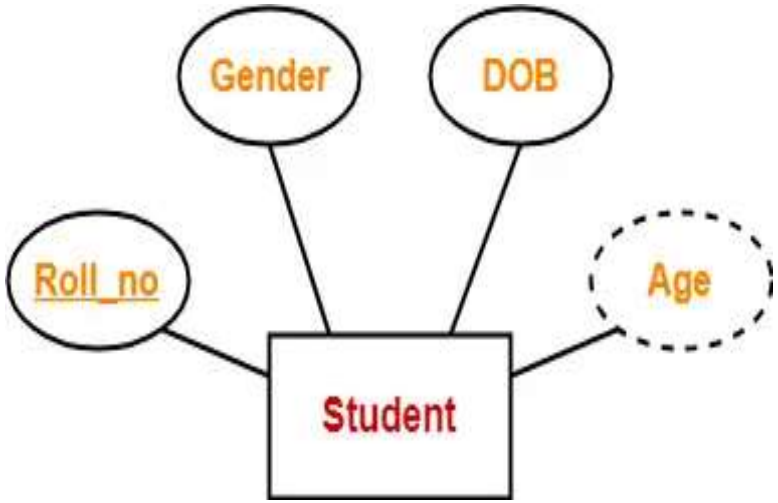
•Multi valued attributes are those attributes which can take more than one value for a given entity from an entity set. It is represented with double ellipse.

•For example: the attributes “Mob_no” and “Email_id” are multi valued attributes as they can take more than one values for a given entity.



## 5. Derived Attributes

- Derived attributes are those attributes which can be derived from other attribute(s).
- It is represented by dashed ellipse
- For example: the attribute “Age” is a derived attribute as it can be derived from the attribute “DOB”.



## 6. Key Attributes

- Key attributes are those attributes which can identify an entity uniquely in an entity set.
- It is represented by ellipse same as other attributes however the text of key attribute is underlined
- For example Rollno of student.