1. What is Entity Relationship Diagram?
2. What are attributes in ER Model? Explain Multivalued and Derived attribute?

**Entity-Relationship Diagram (ER Diagram):**

An **Entity-Relationship Diagram (ERD)** is a visual representation of entities, their attributes, and the relationships between them in a database system. It is a conceptual design used during the database design process to illustrate the structure of data and its relationships.

**Key Components**

**1.**Entities:

* + Objects or concepts that can have data stored about them in the database.
  + Represented as rectangles.
  + Examples: Employee, Department, Product.

1. Attributes:
   * Characteristics or properties of an entity.
   * Represented as ovals connected to their respective entities.
   * Examples: Employee Name, Salary, Department ID.
2. Relationships:
   * Define how entities are related to each other.
   * Represented as diamonds.
   * Examples: Works For, Manages, Belongs To.
3. Primary Keys:
   * Unique identifiers for an entity.
   * Often underlined in the ER diagram.

**Attributes in the ER Model:**

Attributes describe the properties or characteristics of an entity or relationship. Attributes are classified into different types based on their behavior and usage.

**Types of Attributes:**

1. **Simple Attribute**:
   * Atomic and cannot be broken down further.
   * Example: Name, Age.
2. **Composite Attribute**:
   * Can be divided into smaller sub-parts.
   * Example: Full Name can be split into First Name and Last Name.
3. **Single-Valued Attribute**:
   * Holds a single value for each instance of an entity.
   * Example: Age, Salary.
4. **Multi-Valued Attribute**:
   * Can hold multiple values for a single entity instance.
   * Represented by a double oval in ER diagrams.
   * Example: Phone Numbers for an employee.
5. **Derived Attribute**:
   * Not stored directly in the database; instead, it is derived from other attributes.
   * Represented by a dashed oval in ER diagrams.
   * Example: Age derived from Date of Birth.
6. **Key Attribute**:
   * Unique identifier for an entity.
   * Example: Employee ID.

**Multivalued Attribute:**

* **Definition**: An attribute that can have multiple values for a single entity instance.
* **Example**:
  + For an entity Student, the attribute Phone Numbers may store multiple values like +1234567890 and +9876543210.
* **Representation**: A double oval connected to the entity in an ER diagram.

**Derived Attribute:**

* **Definition**: An attribute that can be computed from other attributes or stored data.
* **Example**:
  + For an entity Employee, the attribute Age can be derived from the attribute Date of Birth using the current date.
* **Representation**: A dashed oval connected to the entity in an ER diagram.