1.What is normalization?

Normalization is the process of minimizing redundancy and dependency by organizing fields and table of a database. The main aim of Normalization is to add, delete or modify field that can be made in a single table.

2.Explain primary vs foreign key.

PRIMARY KEY	FOREIGN KEY
A primary key is used to ensure data in the specific column is unique.	A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
It uniquely identifies a record in the relational database table.	It refers to the field in a table which is the primary key of another table.
Only one primary key is allowed in a table.	Whereas more than one foreign key is allowed in a table.
It is a combination of UNIQUE and Not Null constraints.	It can contain duplicate values and a table in a relational database.
It does not allow NULL values .	It can also contain NULL values.

Its value cannot be deleted from the parent table.	Its value can be deleted from the child table.
It constraint can be implicitly defined on the temporary tables.	It constraint cannot be defined on the local or global temporary tables.

3.What are constraints?

Constraints are the rules enforced on the data columns of a table. These are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database. Constraints could be either on a column level or a table level. The column level constraints are applied only to one column, whereas the table level constraints are applied to the whole table.

4.What is a surrogate key?

A surrogate key in a database is a unique identifier for either an entity in the modeled world or an object in the database. The surrogate key is not derived from application data, unlike a natural.
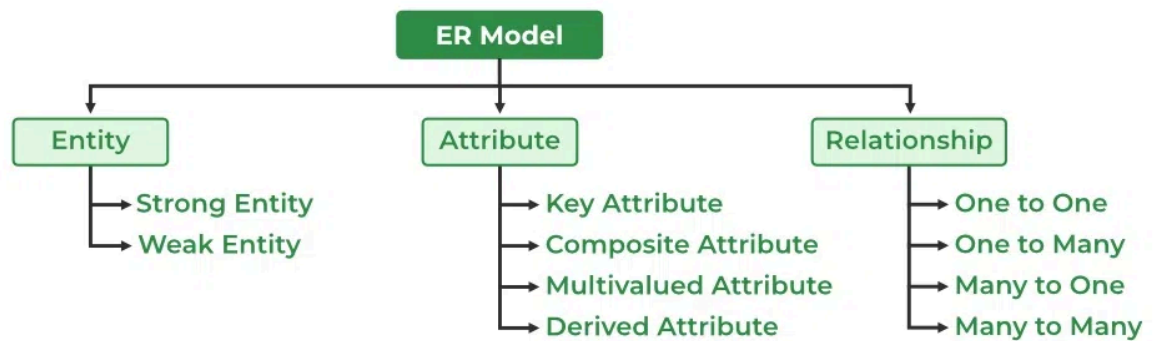
5.How do you avoid data redundancy?

Redundancy in DBMS can be avoided by following the below approaches.

- Redundancy in DBMS can be avoided by normalizing the data through database normalization.
- Redundancy can be avoided using Master Data. Master data is a single source of data accessed by several applications and systems.
- Proper database architecture design can avoid data redundancy.

6.What is ER diagram?

The Entity-Relationship Model (ER Model) is a conceptual model for designing a databases. This model represents the logical structure of a database, including entities, their attributes and relationships between them.

- Entity: An objects that is stored as data such as Student, Course or Company.
- Attribute: Properties that describes an entity such as StudentID, CourseName, or EmployeeEmail.
- Relationship: A connection between entities such as "a Student enrolls in a Course".

ER Model
- Entity
  - Strong Entity
  - Weak Entity
- Attribute
  - Key Attribute
  - Composite Attribute
  - Multivalued Attribute
  - Derived Attribute
- Relationship
  - One to One
  - One to Many
  - Many to One
  - Many to Many

 7.What are the types of relationships in DBMS?

1. One-to-One (1:1) Relationship

In one to one relationships, a record is present in one table along with its corresponding existing relation, and the vacant relation among the records is present in another table. The type of relationship we are talking about is not as usual, and it is normally used when two entities that belong to a specific set need to be stored independently for normalization or security purposes. In another case, a person's employees' data consists of a record in the "personal details" table in a human resources database.

2. One-to-Many (1:N) Relationship

A relationship where the items from one table can be linked to only one or many items from another table is called a one-to-many relationship; in some cases, one item from the first table correlates with only one item from the second table. This connection becomes very strong in that it is particularly used to describe situations where one object can be linked to many similar or identical objects. For example, in an online store backend database, every customer may place multiple orders, yet the master customer record stays the same. If a record has more than one order, these are obtained from the backend database.

3. Many-to-Many (N:M) Relationship

The duality of a many-to-many relationship is characterized by the presence of multiple records belonging to a table in association with multiple records from another table. The interconnection of these relationships follows a junction table format, which is the component that holds both tables together. In the many-to-many relationship model, a wide variety of complex relationships can be established where each entity has many related entities. Such a database for a music

streaming service could have a table representing each track that belongs to multiple playlists, and each of them could contain multiple tracks.

8.Explain the purpose of AUTO_INCREMENT.

Auto Increment is a feature in MySQL that automatically assigns a unique value to a field each time a new record is inserted into a table. The AUTO_INCREMENT attribute applies to a numeric column, and it guarantees that each new record will have a unique, sequential value that is one greater than the previous value. This feature is particularly useful when creating primary keys for tables, as it simplifies the process of generating unique values for each new record.

Syntax

The syntax for creating a table with an auto-incremented column is as follows:

Syntax :

CREATE TABLE table_name (

  column1 datatype AUTO_INCREMENT,

  column2 datatype,

  ...

);

9.What is the default storage engine in MySQL?

Database engines are MySQL components that can handle SQL operations like create, read, update data from a database. There are two types of engines in MySQL: transactional and non-transactional.InnoDB is the default engine for MySQL 5.5 and above versions. Major DBMS uses an application programming interface(API) to enable the interaction of users with database engines. It is very necessary to know about the engines for production databases and it also impacts future development. To access the list of available MySQL engines we run SHOW ENGINES; query.

There are 2 types of database engines :

- **Transactional Databases:** In this type, we can roll back the write operations on the database if they are left incomplete. These operations are known as transactions. Majorly, modern engines are transactional.

- **Non-Transactional Databases:** Unlike transactional databases, they don't provide Rollback/Commit. Instead, we need to manually code to perform the rollback operations.

 10.What is a composite key?

A Composite key is a set of columns whose values uniquely identify every row in a table. What it means is that, table which contains composite key will be indexed based on columns specified in the primary key. This key will be referred in Foreign Key tables.