Normalization

- Normalization is the process of organizing the data in the database.

- Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate the undesirable characteristics like Insertion, Update and Deletion Anomalies

- Normalization divides the larger table into the smaller table and links them using relationship.

- The normal form is used to reduce redundancy from the database table.

Normal Form	Description
1NF	A relation in 1 NF if it contains an atomic value
2NF	A relation will be in 2NF if it is in 1 NF and all non-key attributes are fully functional dependedent on the primary key.
3NF	A relation will be in 3 NF if it is in 2NF and no transition dependency exists.
4NF	A relation will be in 4 NF if it is in Boyce Codd Normal form and has no multi-valued dependency.
5NF	A relation is in 5 NF if it is in 4 NF and not contain any join dependency and joining should be lossless.

Keys:-

1. Super key:-

→ Set of Attributes that can identify each tuple uniquely in the given relation.

→ A super key is not restricted to have any specific number of attributes.

⇒ Thus, a super key ~~attributes~~ may consist of any number of attributes.

2. Candidate Key:-

A set of minimal attribute(s) than can identify each tuple uniquely in the given relation is called as a candidate key.

3. Primary key

A primary key is a candidate key that the database designer selects while designing the database

→ The value of primary key can never be NULL.

→ The value of primary key can never be unchanged i.e. no updation is possible.

→ The value of primary key must be assigned when inserting a record.

→ A relation is allowed to have only one Primary key.

4. Alternate Keys:-

Candidate keys that are left unimplemented as unused after implementing the primary key are called as Alternate keys.

5. Foreign Key:-

Foreign key are the column of the table used to point to the primary key of another table.

6. Composite key:-
Whenever a primary key consists of more than one attribute, it is known as Composite key.
This key is also known as Concatenated keys.

Order of execution

1. From and Join
2. Where
3. Group By
4. Having
5. Select
6. Distinct
7. Order by
8. Limit/Offset

SQL Subqueries

→ SQL Subqueries or nested queries are SQL statements where we need the results from our database after using multiple filters.

→ Q A Subquery is put to restrict the data pool for the main query, i.e. the inner query gives us the data which is the pool for the main query

Type of SQL Subquery:-

1. Single Row Subquery:-
Return zero or one row in results.

2. Multiple Row Subquery.
Returns one or more rows in results.

3. Multiple Column Subquery
Returns one or Column Columns

4. Correlated Subquery
Returns one or more Columns according to the main or outer query. For. ? has ~~called~~ called a correlates Sub query.

5. Nested Subquery:-
Queries within a query (inner and Outer query).