

Unit-IV

Keys :-

- A DBMS key is an attribute or set of an attribute which helps you to identify a tuple in a relation table.
- They allow us to find the relation between two tables.
- Keys help us uniquely identify a row in a table by a combination of one or more columns in that table.

Super key :-

- A superkey is a group of single or multiple keys which identifies rows in a table.
- A Super key may have additional attributes that are not needed for unique identification.

Alternate key :-

- **ALTERNATE KEYS** is a column or group of columns in a table that uniquely identify every row in that table.
- A table can have multiple choices for a primary key but only one can be set as the primary key.
- All the keys which are not primary key are called an Alternate Key.

Candidate key:

- **CANDIDATE KEY** is a set of attributes that uniquely identify tuples in a table.
- Candidate Key is a super key with no repeated attributes.
- The Primary key should be selected from the candidate keys.
- Every table must have at least a single candidate key.
- A table can have multiple candidate keys but only a single primary key.

Properties of Candidate key:

- It must contain unique values
- Candidate key may have multiple attributes
- Must not contain null values
- It should contain minimum fields to ensure uniqueness
- Uniquely identify each record in a table

Compound key :-

- **COMPOUND KEY** has two or more attributes that allow you to uniquely recognize a specific record.

- It is possible that each column may not be unique by itself within the database.
- However, when combined with the other column or columns the combination of composite keys become unique.
- The purpose of compound key is to uniquely identify each record in the table.

Composite key :-

- **COMPOSITE KEY** is a combination of two or more columns that uniquely identify rows in a table.
- The combination of columns guarantees uniqueness, though individually uniqueness is not guaranteed.
- Hence, they are combined to uniquely identify records in a table.
- The difference between compound and the composite key is that any part of the compound key can be a foreign key, but the composite key may or maybe not a part of the foreign key.

Primary key :-

- **PRIMARY KEY** is a column or group of columns in a table that uniquely identify every row in that table.
- The Primary Key can't be a duplicate meaning the same value can't appear more than once in the table.
- A table cannot have more than one primary key.

Rules for defining Primary key:

- Two rows can't have the same primary key value
- It must for every row to have a primary key value.
- The primary key field cannot be null.
- The value in a primary key column can never be modified or updated if any foreign key refers to that primary key.

Foreign key:-

- **FOREIGN KEY** is a column that creates a relationship between two tables.
- The purpose of Foreign keys is to maintain data integrity and allow navigation between two different instances of an entity.
- It acts as a cross-reference between two tables as it references the primary key of another table.

Functional dependency :-

- A functional dependency (FD) is a relationship between two attributes, typically between the PK and other non-key attributes within a table.
- For any relation R, attribute Y is functionally dependent on attribute X (usually the PK), if for every valid instance of X, that value of X uniquely determines the value of Y.
- This relationship is indicated by the representation below :

X -----> Y

- The left side of the above FD diagram is called the **determinant**, and the right side is the **dependent**.

Fully functional dependency(FFD):-

The term full functional dependency (FFD) is used to indicate the minimum set of attributes in of a functional dependency (FD).

In other words, the set of attributes X will be functionally dependent on the set of attributes Y if the following conditions are satisfied:

- X is functionally dependent on Y and
- X is not functionally dependent on any subset of Y.

Or

In a relation , there exists Full Functional Dependency between any two attributes X and Y, when X is functionally dependent on Y and is not functionally dependent on any proper subset of Y.

Partial Functional Dependency :

In a relation, there exists Partial Dependency, when a non prime attribute (the attributes which are not a part of any candidate key) is functionally dependent on a proper subset