



Types of Keys in Database Management System

Why we have Keys in DB?

- A Key is an attribute or a set of attributes in a relation that identifies a tuple (record) in a relation.
- The keys are defined in a table to access or sequence the stored data quickly and smoothly.
- They are also used to create relationship between different tables.

Types of Keys in Database

- **1. Primary Key**
- **2. Candidate Key**
- **3. Alternate Key**
- **4. Super Key**
- **5. Composite Key**
- **6. Foreign Key**

Primary Key

Employee
<u>EmployeeID</u>
EmployeeName
SSN
DeptID
DOB

- Which is **Unique & Can't be have NULL Value**
- Is the column you choose to maintain uniqueness in a table at row level.
- Here in **Employee** table we can choose either **EmployeeID** or **SSN** column for a PK.
- **EmployeeID** is preferable choice because SSN is a secure (PII) value.

Primary Key

- It is a candidate key that is chosen by the database designer to identify entities within an entity set.
- Primary key is the minimal super key. In the ER diagram primary key is represented by underlining the primary key attribute.
- Ideally a primary key is composed of only a single attribute.
- But it is possible to have a primary key composed of more than one attribute.

To define a field as primary key, following conditions had to be met :

- 1. No two rows can have the same primary key value.
- 2. Every row must have a primary key value.
- 3. The primary key field cannot be null.
- 4. Value in a primary key column can never be modified or updated, if any foreign key refers to that primary key.

Candidate Key

Employee
<u>EmployeeID</u>
EmployeeName
<u>SSN</u>
DeptID
DOB

- Are individual columns in a table that qualifies for uniqueness of each row/tuple.
- Here in **Employee** table **EmployeeID** & **SSN** are eligible for a **Primary Key** and thus are ***Candidate keys***.
- Candidate Keys are super keys for which no proper subset is a super key. In other words candidate keys are minimal super keys.

Alternate Key

Employee
EmployeeID
EmployeeName
<u>SSN</u>
DeptID
DOB

- Candidate column other the Primary column, like if **EmployeeID** is set for a PK then **SSN** would be the Alternate key.

Super Key

Employee
<u>EmployeeID</u>
<u>EmployeeName</u>
SSN
DeptID
DOB

- If you add any other Column / Attribute to a Primary Key then it become a Super Key, like **EmployeeID + EmployeeName** is a Super Key.
- Super key stands for superset of a key.
- **A Super Key is a set of one or more attributes that are taken collectively and can identify all other attributes uniquely.**

Composite Key

Employee
EmployeeID
<u>EmployeeName</u>
SSN
DeptID
<u>DOB</u>

- If a table do have a single column that qualifies for a Candidate key, then you have to select 2 or more columns to make a row unique.
- Like if there is no EmployeeID or SSN columns, then you can make **EmployeeName + DateOfBirth (DOB)** as **Composite Primary Key**. *But still there can be a narrow chance of duplicate rows.*

Foreign Key

Employee
EmployeeID
EmployeeName
SSN
<u>DeptID</u>
DOB

Department
<u>DeptID</u>
DeptName

- Here in above tables **DeptID** of Department table is Primary Key where as **DeptID** of Employee is an Foreign key.
- It means it has referred to another table. This concept is also known as **Referential**

Integrity.

