Types of Keys in Database Management System

SoS in Computer Science and Application

PGDCA 203 : DBMS

Presented By

Shruti Dubey

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*
7. *Unique Key*

Primary Key

- 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 is the minimal super keys. 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

Employee

EmployeeID

EmployeeName

SSN

DeptID

DOB

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

- No two rows can have the same primary key value.

- Every row must have a primary key value.

- The primary key field cannot be null.

- Value in a primary key column can never be modified or updated, if any foreign key refers to that primary key

Candidate Key

- 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*.

Employee

EmployeeID

EmployeeName

SSN

DeptID

DOB

Alternate Key

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

Employee
EmployeeID
EmployeeName
SSN
DeptID
DOB

Super Key

- 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.*

Employee

EmployeeID

EmployeeName

SSN

DeptID

DOB

Composite Key

- 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.

Employee
EmployeeID
EmployeeName
SSN
DeptID
DOB

Foreign Key

- Here in below 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 know as *Referential Integrity*.

Employee
EmployeeID
EmployeeName
SSN
DeptID
DOB

Department
DeptID
DeptName

Unique Key

- *Unique key* is same as primary with the difference being the existence of null.

- Unique key field allows one value as NULL value.

Employee

EmployeeID

EmployeeName

SSN

EmailID

DOB