SNS COLLEGE OF TECHNOLOGY

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Department of MCA

DBMS Introduction

Course Name : 19CAT609 - DATA BASE MANAGEMENT SYSTEM

Class : I Year / II Semester

Unit II – Relational Constraints

Constraints

- **Constraints**

- Every relation has some conditions that must hold for it to be a valid relation. These conditions are called Relational Integrity Constraints. There are three main integrity constraints –

- **Key constraints**

- Domain constraints

- Referential integrity constraints

Constraints

Key Constraints

- There must be at least one minimal subset of attributes in the relation, which can identify a tuple

  uniquely. This minimal subset of attributes is called key for that relation. If there are more than one such

  minimal subsets, these are called candidate keys.

Key constraints force that –

- in a relation with a key attribute, no two tuples can have identical values for key attributes.

- a key attribute can not have NULL values.

- Key constraints are also referred to as Entity Constraints.

Domain Constraints

Attributes have specific values in real-world scenario. For example, age can only be a positive integer. The

same constraints have been tried to employ on the attributes of a relation. Every attribute is bound to have a

specific range of values. For example, age cannot be less than zero and telephone numbers cannot contain a

digit outside 0-9.

Referential integrity Constraints

Referential integrity constraints work on the concept of Foreign Keys. A foreign key is a key attribute of a

relation that can be referred in other relation.

Referential integrity constraint states that if a relation refers to a key attribute of a different or same relation,

then that key element must exist.

- Relational Model

Relational Model Constraints

★ Constraints on databases:

- Inherent model-based: Inherent in the data model.
- Schema based: Defined directly in the schemas of the data model.
- Application based: Must be expressed and enforced by the application programs.

- Relational Model

- Relational Model

- Relational Model

❖ **Schema–based Constraints**

★ **Key Constraints:**

- A key satisfies 2 constraints:

(i) Two tuples cannot have identical values for all the attributes in the key.

(ii) It is a minimal superkey.

STUDENT	RollNo	Name	Age	Email
	1	Jeremy	14	jeremy16@gmail.com
	2	Josh	14	josh25@gmail.com
	3	Charles	15	charly01@gmail.com
	3	Alicia	13	alicia22@gmail.com

Not possible

SK = { RollNo }, { Email },
{ RollNo, Name }, { RollNo, Age },
{ RollNo, Email }, { Name, Email },
{ Age, Email },
{ RollNo, Name, Age, Email }

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- Relational Model
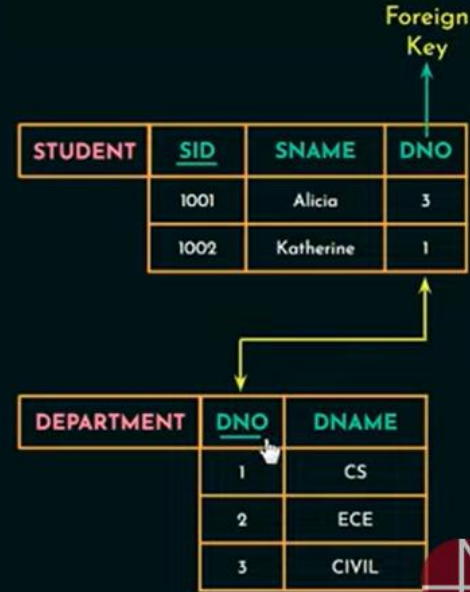
- Relational Model

- Relational Model

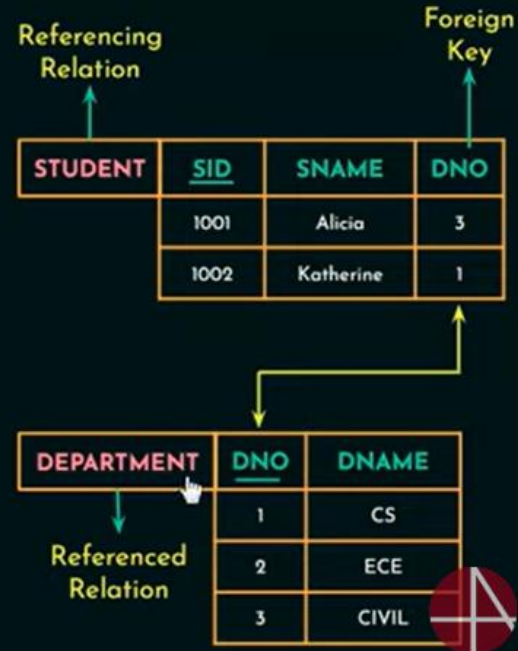
❖ **Schema–based Constraints**

★ **Referential Integrity Constraint:**

- Foreign key must satisfy the following:

  (i) same domain.

  (ii) Value of FK in a tuple either occurs as a value of PK i.e.,

  $t_1[FK] = t_2[PK]$ or is null.

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Referencing Relation → STUDENT

Foreign Key → DNO

STUDENT	SID	SNAME	DNO
	1001	Alicia	3
	1002	Katherine	1

DEPARTMENT	DNO	DNAME
	1	CS
	2	ECE
	3	CIVIL

Referenced Relation

References

1. https://www.tutorialspoint.com/dbms/relational_data_model.htm
2. https://www.javatpoint.com/dbms-integrity-constraints
3. https://www.prepbytes.com/blog/dbms/constraints-in-dbms-and-types/