Constraints

COURSE : 23CAT- Database Management System
UNIT I : Introduction
CLASS : I Semester / I MCA

SQL Aspects

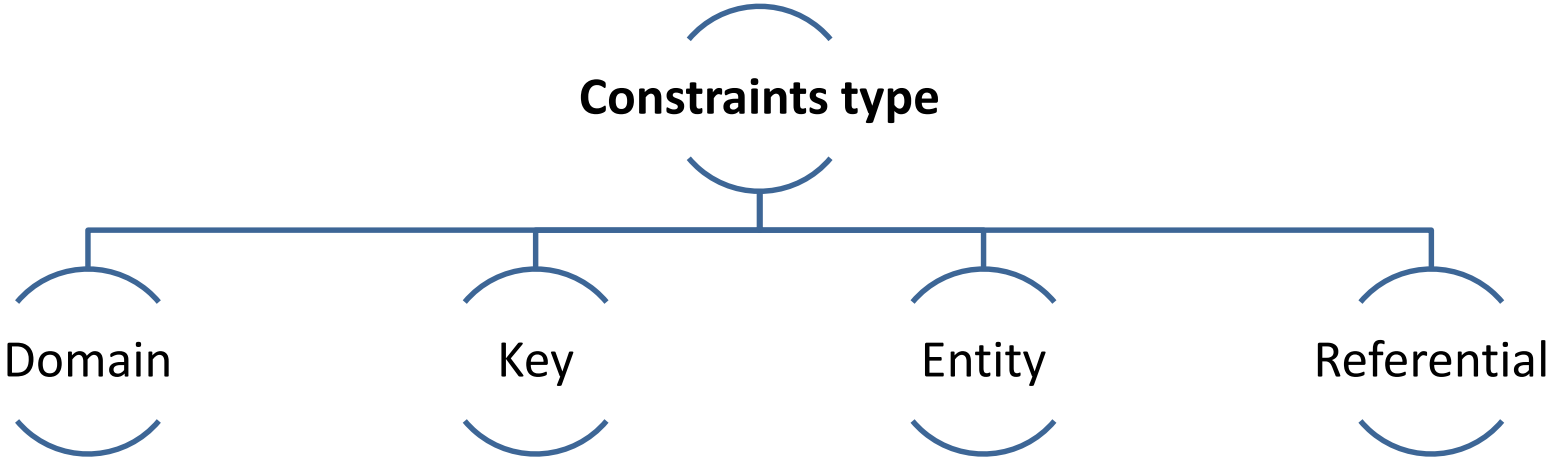
- Constraints are restrictions like what values are allowed to be inserted in the relation, what kind of modifications and deletions are allowed in the relation
- These are the restrictions we impose on the relational database

Constraints

Constraints are applied in the data model is called **Implicit constraints**

Constraints that are directly applied in the schemas of the data model, by DDL (Data Definition Language), called as schema-based or **Explicit constraints**

Constraints that cannot be directly applied in the schemas of the data model, called as Application based or **semantic constraints**


Constraints type
Domain
Key
Entity
Referential

- Every domain must contain atomic values(smallest indivisible units)
- It means that composite and multi-valued attributes are not allowed.
- We perform datatype check here, which means when we assign a data type to a column we limit the values that it can contain.
  - Ex. If we assign the datatype of attribute age as int, we cant give it values other then int datatype

- These are called uniqueness constraints since it ensures that every tuple in the relation should be unique
- A relation can have multiple keys or candidate keys(minimal superkey), out of which we choose one of the keys as primary key, we don't have any restriction on choosing the primary key out of candidate keys, but it is suggested to go with the candidate key with less number of attributes
- Null values are not allowed in the primary key, hence Not Null constraint is also a part of key constraint

Violation

EID	Name	Phone
01	Bikash	6026526747
02	Paul	7002494274
01	Tuhin	9234567892

- Entity Integrity constraints says that no primary key can take NULL value, since using primary key we identify each tuple uniquely in a relation

EID is made primary key, and the primary key cant take NULL values

EID	Name	Phone
01	Bikash	7002494274
02	Paul	6026526747
NULL	Sony	9234567892

- The Referential integrity constraints is specified between two relations or tables and used to maintain the consistency among the tuples in two relations.
- This constraint is enforced through foreign key
  - when an attribute in the foreign key of relation R1 have the same domain(s) as the primary key of relation R2, then the foreign key of R1 is said to reference or refer to the primary key of relation R2.
- The values of the foreign key in a tuple of relation R1 can either take the values of the primary key for some tuple in relation R2, or can take NULL values, but can’t be empty

Example:

EID	Name	DNO
01	Divine	12
02	Dino	22
04	Vivian	14

DNO	Place
12	Jaipur
13	Mumbai
14	Delhi

- In the above, DNO of the first relation is the foreign key, and DNO in the second relation is the primary key.
- DNO = 22 in the foreign key of the first table is not allowed since DNO = 22 is not defined in the primary key of the second relation. Therefore Referential integrity constraints is violated here

Architectural Design Challenges