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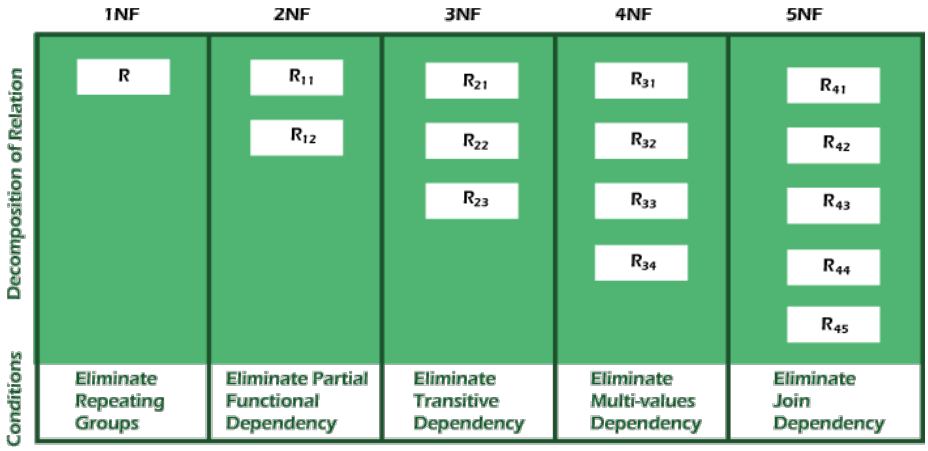
AIM:	To learn about normalization
PROBLEM STATEMENT :	perform 1nf and 2 nf in SQL

Theory :	***WHAT IS NORMALIZATION?*** • Normalization is the process of organizing the data in the database. • Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate undesirable characteristics like Insertion, Update, and Deletion Anomalies. • Normalization divides the larger table into smaller and links them using relationships. • The normal form is used to reduce redundancy from the database table. ***Why do we need Normalization?*** The main reason for normalizing the relations is removing these anomalies. Failure to eliminate anomalies leads to data redundancy and can cause data integrity and other problems as the database grows. Normalization consists of a series of guidelines that helps to guide you in creating a good database structure.

Data modification anomalies can be categorized into three types:

- **Insertion Anomaly:** Insertion Anomaly refers to when one cannot insert a new tuple into a relationship due to lack of data.
- **Deletion Anomaly:** The delete anomaly refers to the situation where the deletion of data results in the unintended loss of some other important data.
- **Updatation Anomaly:** The update anomaly is when an update of a single data value requires multiple rows of data to be updated.



Normal Form	Description
1NF	A relation is in 1NF if it contains an atomic value.
2NF	A relation will be in 2NF if it is in 1NF and all non-key attributes are fully functional dependent on the primary key.

3NF	A relation will be in 3NF if it is in 2NF and no transition dependency exists.

BCNF	A stronger definition of 3NF is known as Boyce Codd's normal form.
4NF	A relation will be in 4NF if it is in Boyce Codd's normal form and has no multi-valued dependency.

Advantages of Normalization

- Normalization helps to minimize data redundancy.
- Greater overall database organization.
- Data consistency within the database.
- Much more flexible database design.
- Enforces the concept of relational integrity.

Disadvantages of Normalization

- You cannot start building the database before knowing what the user needs.
- The performance degrades when normalizing the relations to higher normal forms, i.e., 4NF, 5NF.
- It is very time-consuming and difficult to normalize relations of a higher degree.
- Careless decomposition may lead to a bad database design, leading to serious problems.

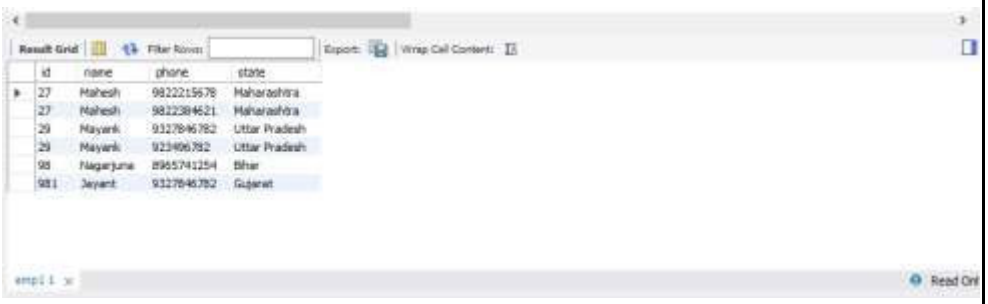
Queries	**USING DATABASE:** create database bhaya; use bhaya; **CREATING TABLE FOR 1NF:** create table emp1(id int, name varchar(50), phone bigint , state varchar(20)); insert into emp1() values(27,"Mahesh",9822215678,'Maharashtra'),(27,"Mahesh",9822 384621,'Maharashtra'),(29,"Mayank",9327846782,'Uttar Pradesh'),(29,"Mayank",923496782,'Uttar Pradesh'),(98,"Nagarjuna",8965741254,'Bihar'),(981,"Jayant",93278 46782,'Gujarat'); select * from emp1; **CREATING ANOTHER TABLE TO DECOMPOSE**: create table teacher(id int, subject varchar(255), age int); insert into teacher() values(56,"English",30),(56,"Mathematics",30),(89,"English",27),(89," History",27),(33,"Geography",22); create table 2nf(id int, age int); **CREATING A TABLE FOR 2NF:** create table 2nf_extra(id int, subject varchar(255));

```
insert into 2nf()
values(56,30),(89,27),(33,22);

insert into 2nf_extra()
values(56,"English"),(56,"Mathematics"),(89,"English"),(89,"History"),
(33,"Geography");

select * from teacher;
select * from 2nf; select
* from 2nf_extra;
```

RESULT FOR 1NF:



id	name	phone	state
27	Mahesh	9822215678	Maharashtra
27	Mahesh	9822384621	Maharashtra
29	Mayank	9127846782	Uttar Pradesh
29	Mayank	923496782	Uttar Pradesh
98	Nagarjuna	8965741254	Bihar
981	Jayant	9127846782	Gujarat

RESULT AFTER DECOMPOSTION(1ST TABLE FOR 2NF):

id	subject	age
56	English	30
56	Mathematics	30
89	English	27
89	History	27
33	Geography	22

RESULT AFTER 2ND TABLE FOR 2NF:

id	age
56	30
89	27
33	22

RESULT AFTER 3RD TABLE FOR 2NF:

Conclusion:
Learned when to use various forms and how to apply the required forms on tables