

DATABASE MANAGEMENT SYSTEM

NORMALIZATION IN DBMS :-

* Normalization is a process of organizing the data in database to avoid data redundancy insertion anomaly update anomaly & deletion anomaly
Let's discuss about anomaly

* There are three types of Anomalies that occur when the database is not normalized. These are insertion, update and deletion anomaly.

TYPES OF NORMAL FORM :-

Here the most commonly used normal forms are,

- * First normal form (1NF)
- * Second normal form (2NF)
- * Third normal form (3NF)
- * Boyce & Codd normal form (BCNF)

FIRST NORMAL FORM (1NF) :-

As per the rule of first normal form an attribute of a table cannot hold multiple values. It should hold only atomic values.

Example :-

Suppose a company wants to store the names and contact of its employees. It creates a table that looks like this :

emp_id	emp_name	emp_address	emp_mobile
101	Haseera	New delhi	8912312390
102	Nasirath	Kanpur	8812121212
103	Fairose	chennai	9900123432
104	Jaburth	Bangalore	7776663331

Two employees (Nasrath & Jaburth) are having two mobile numbers so the company stored them in the same field as you can see in table

* This table is not in 1NF as the rule says "each attribute of a table must have atomic values the emp-mobile values for employees Nasrath & Jaburth violates that rule

emp_id	emp_name	emp_address	emp_mobile
101	Haseera	New-delhi	8912312390
102	Nasrath	Kanpur	8812121232
102	Nasrath	Kanpur	9823221232
103	Fairose	Chennai	9993330001
104	Jaburth	Bangalore	8123450987
104	Jaburth		

SECOND NORMAL FORM (2NF) :-

A table is said to be in 2NF both the following condition,

- * Table is in 1NF
- * NO non-prime attribute is dependent on the proper subset of any candidate key of table.
- * An attribute that is not part of any candidate key is known as non-prime attribute.

Teacher_id	Subject	Teacher_age
111	Maths	38
111	physics	38
222	Biology	38
333	physics	40
333	chemistry	40

candidate Keys : { Teacher_id, Subject }

non prime attribute : Teacher-age .

To make the table complies with 2NF we can break it in two tables like this :-

Teacher_id	Teacher_age
111	38
222	38
333	40

Teachers - subject table :-

Teacher_id	Subject
111	Maths
111	physics
222	Biology
333	physics
333	chemistry

Now the tables comply with second normal form

(2NF)

THIRD NORMAL FORM (3NF) :-

A Table design is said to be in 3NF if both the following conditions hold

- * Table must be in 2NF
- * Transitive functional dependency of non prime attribute on any super key should be removed.

* X is a Super Key of table

* Y is a prime attribute of table

Example :-

Suppose a company wants to store the complete address of each employee they create table,

emp_id	dep_name	emp_zip	emp_state	emp_city
1001	John	282500	UP	Agra
1002	Ajeet	292523	TN	Chennai
1201	Lora	292524	TN	Chennai

Super keys :- {emp_id} {emp_id, emp_name}

{emp_id, emp_name, emp_zip}

candidate key :- {emp_id}

Employee table :-

emp_id	emp_name	emp_zip
1001	John	282500
1002	Ajeet	292523
1201	Lora	292524