

Summary of 11 Normal forms



1NF (First Normal form)

⇒ If a table contains multiple values of one attribute then
 ⇒ Not a normal form.

Condition for 1NF:

1. Only single value attribute

like!

| Roll No. | Course |
|----------|--------|
| 1 | DBMS |
| 2 | CN |

It is in 1NF

| Roll No. | Course | |
|----------|---------|-------------------------|
| 1 | DBMS, C | Invalid not a 1NF |
| 2 | CN, C++ | |

Remarks

Key Point
 1NF follow atomic rule

Solution for that:



If we have multiple attribute then break table like

| | | |
|---------|---------|--------------|
| Roll No | Courses | → Table ① |
| 1 | DBMS | |
| 2 | CN | → Table ② |
| 1 | C | |
| 2 | C++ | |

2NF (Second Normal form)

First condⁿ : must be in 1NF

② Partial dependency (NO*)

③ Only full dependency

like:

fy $(AB) \rightarrow C$ → candidate key

Remarks

$A \rightarrow C$

$B \rightarrow C$

X

X

{ Not possible }

↓
Partial dependency

3NF (Third Normal form)

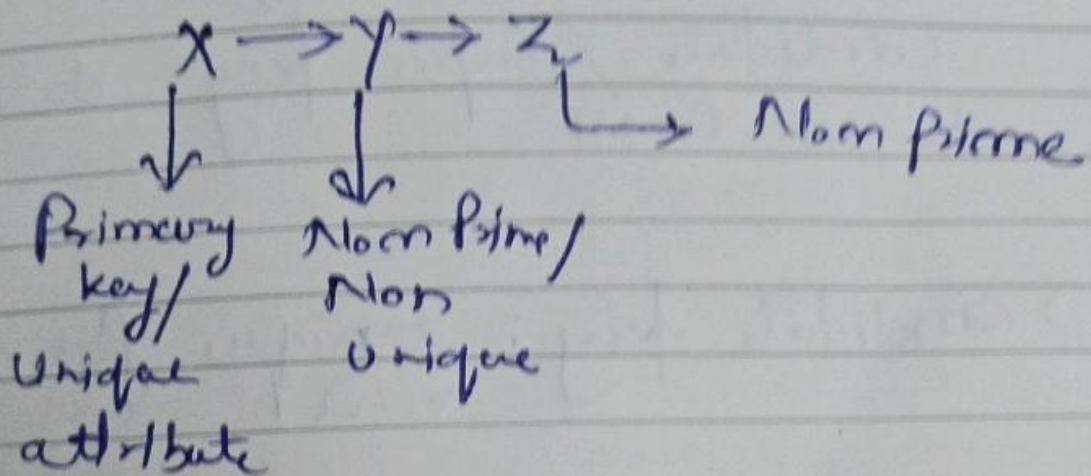


Condition:

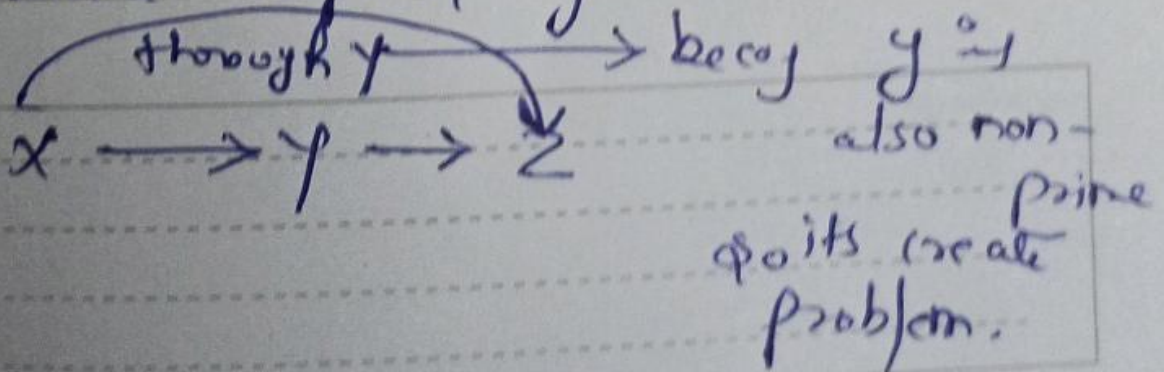
① must be in 2NF

② No transitive dependency

means

* Non-prime attribute Z, Y

but X is indirectly connected through with Z so it is known as transitive dependency.





BCNF (Boyce - Codd)

Condition:

① must be in 3NF

LHS (⁺ left hand side of attribute) always be

Candidate / Super key so it is in BCNF.

⇒ Candidate key: unique for every row.

⇒ Super key: combination of columns that uniquely identifies any row.

Remarks

4NF (4th Normal form)

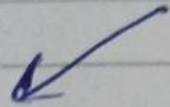


Conditions: must be in BCNF

No multivalued dependency \oplus



means



Shivani \rightarrow 3 Mobile No
 \rightarrow 3 Email

Store in table like —

| | | |
|---------|----|----|
| Shivani | m1 | e1 |
| Shivani | m1 | e2 |
| Shivani | m1 | e3 |
| ⋮ | m2 | e1 |
| ⋮ | m2 | e2 |
| ⋮ | m2 | e3 |
| ⋮ | ⋮ | ⋮ |

Remarks

This is multivalued dependency.

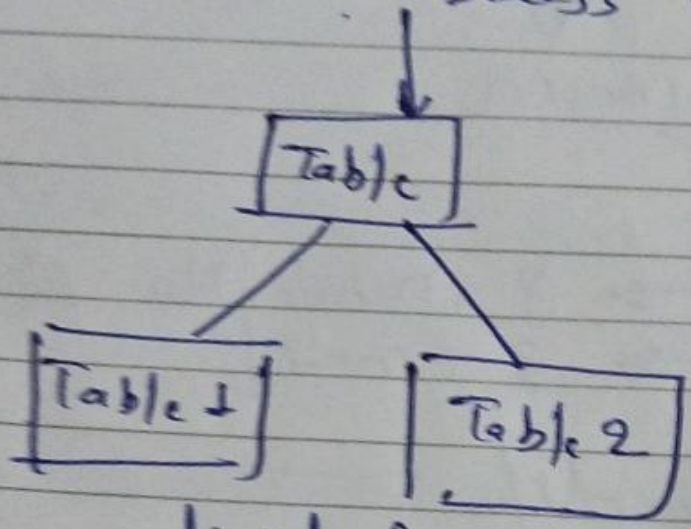


5th Normal form

condition! In 4th NF

(+)

lossless decomposition



divide in vertical (col^m) form.

There will be chance of extra tuple (row)

it is lossy so remove that
 use common in both table like candidate key so it reduces at redundancy.

Remarks