NORMALIZATION

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NORMALIZATION

What is Normalization ?

" It is the process of reducing a large table into smaller tables in order to remove redundancies and anomalies by identifying their functional dependencies is known as Normalization . "

Or

"The process of decomposing a large table into smaller table is known as Normalization ."

Or

"Reducing a table to its Normal Form is known as Normalization . "
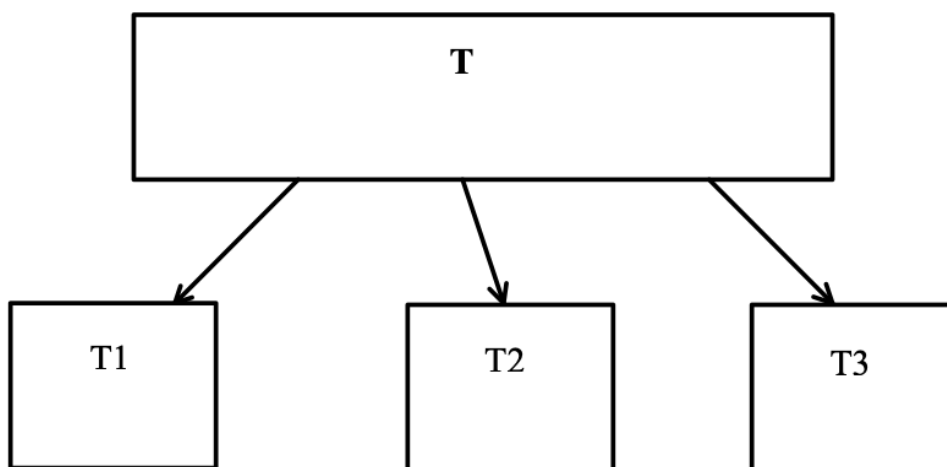
What is **Normal Form** ?

A table without redundancies and anomalies are said to be in Normal Form .

Levels of Normal From .
1. **First Normal Form (1NF)**
2. **Second Normal Form (2NF)**
3. **Third Normal Form (3NF)**

Note : **If any Table / entity is reduced to 3NF , then the table is said to be normalized.**

1. First Normal Form (1NF) :
- No duplicates records .
- Multivalued data should not be present .

QSPIDERS

QID	NAME	COURSE
1	A	JAVA
2	B	JAVA , SQL
3	C	MT , SQL
1	A	MT

→

QID	NAME	C1	C2	C3
1	A	JAVA		MT
2	B	JAVA	SQL	
3	C		SQL	MT

2. Second Normal Form (2NF)
- Table should be in 1NF
- Table should not have Partial Functional Dependency .

EMPLOYEE - (EID , ENAME , SAL , DEPTNO , DNAME , LOC)

Eid	ename	sal	Deptno	dname	Loc
1	A	100	10	D1	L1
2	B	120	20	D2	L2
3	C	320	10	D1	L1
4	D	251	10	D1	L1

Eid - ename ,sal
Deptno - dname , loc

:- (*Eid , deptno*) -> (Ename , Sal , Dname , Loc)

composite key attribute results in PFD

R1 - (EID , ENAME , SAL)
R2 - (DEPTNO , DNAME , LOC)

R1

Eid	ename	sal
1	A	100
2	B	120
3	C	320
4	D	251

R2

Deptno	dname	Loc
10	D1	L1
20	D2	L2

3. Third Normal Form (3NF)

- Table should be in 2NF .
- Table should not have Transitive Functional Dependency .

Employee - (EID , Ename , Sal , comm , Pin code , state , country)

:- Transitive Functional Dep

EID -> ENAME
        SAL
        COMM
        PINCODE -> STATE
R1- (eid , ename , country) COUNTRY
R2- (pincode , state , country)

Customer

CID	CNAME	PINCODE	CITY	STATE
1	Smith	510001	Bangalore	Karnataka
2	Miller	510002	Mumbai	Maha
3	Scott	510001	Bangalore	Karnataka
4	Adams	510001	Bangalore	Karnataka
5	Scott	510002	Mumbai	Maha

Customer : (**cid** , cname , pincode , city , state)

(PK)Cid- Cname
            Pincode - City
                      State

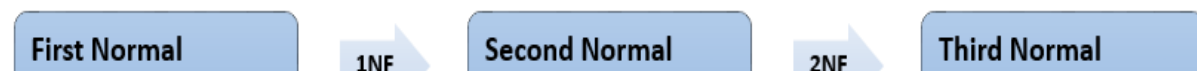R1 - (**Cid** , Cname , Pincode)
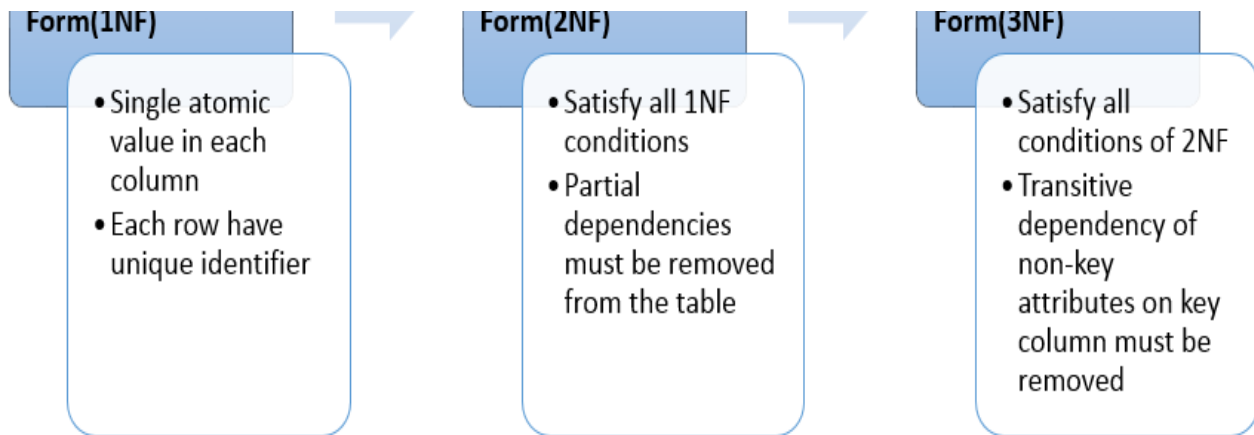R2 - (**Pincode** , City , State)

R1

CID	CNAME	PINCODE(fk)
1	Smith	510001
2	Miller	510002
3	Scott	510001
4	Adams	510001
5	Scott	510002

R2

PINCODE	CITY	STATE
510001	Bangalore	Karnataka
510002	Mumbai	Maha

QUICK NOTE :

First Normal   1NF →   **Second Normal**   2NF →   **Third Normal**

Form(1NF)

- Single atomic value in each column
- Each row have unique identifier

Form(2NF)

- Satisfy all 1NF conditions
- Partial dependencies must be removed from the table

Form(3NF)

- Satisfy all conditions of 2NF
- Transitive dependency of non-key attributes on key column must be removed

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