Pushpraj Singh

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1.) First Normal Form -

If a relation contains composite or multi valued attribute, it violates 1NF.

A relation is in 1NF if every attribute in that relation is single valued attribute.

Doc No	Name	Add.	Phone	Dep. id.	Designation	Charges	Pat. No	Pat Name	
D1	Dr Nadeem	ABC123	033-123	Neurology	Staff	5000	P1	Kahlid	...

CNIC	Phone	Room No	Room Type	Bed No.
12345-1	042-1	R2	Normal	B1

In this way all the composite or multivalued attribute will be removed.

→ It will have only single valued attribute.
→ Values stored in column are of same domain
→ All columns are unique.

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2.) Second Normal form -

for a table to be in 2NF, it should be in 1NF & it should not have any partial dependency.

Table-1

Doctor_info

Doc No.	Name	Add.	Dep id	Designation	Charges/hour	Designation
D1	Nadeem	Abc123	Neuro	Prof.	5000	Proffesor
⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮

Table 2

Doc_phone

DP Id	Phone No.	Doc No
1	0333-123	D1
2	042-123	D1
⋮	⋮	⋮
⋮	⋮	⋮

Table 3

Doc_designation

DD_id	Doc_No	Dep_Id
1	D1	Neurology
2	D2	Orthopedic
3	D4	ENT
⋮	⋮	⋮

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Table - 4

Patient_table

Patient No.	Pat. Name	CNIC	Phone
P1	Kahlid	12345-1	042-1
P5	Ahmed	12345-2	042-2
⋮	⋮	⋮	⋮

Table - 5

Doc_patient table

DP ID	Doc Id	Pat Id	Admitted
1	D1	P1	Yes
2	D1	P5	Yes
3	D1	P7	No.
⋮	⋮	⋮	⋮

Table - 6

Room_details table

~~Bed No.~~	~~DP Id~~	~~Room No.~~
Bed No.	Room No	Room Type
B1	R2	Normal
B5	R4	Two bed
B7	R9	Two bed
B8	R5	Special
B9	R6	Special

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Table 7
Doc_patient_bed_details

Id	Doc_No	Pat_No	Bed_No
1	D1	P1	B1

Id	DP Id	Bed NO
1	1	B1
2	2	B1
3	4	B5
:	:	:

3) Third Normal Form (3NF)
A table is said to be in 3NF when it is in 2NF & it doesn't have any transitive dependency.

Since above all table doesn't have any transitive dependency & its also in 2NF so it is also in 3NF.

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4) Boyce & Codd Normal form (BCNF)

BCNF is a higher version of 3NF. This form deals with certain type of anolomy that is not handled in 3NF.

For a table to be in BCNF, it must be in 3NF & for each functional dependency (X → Y), X should be a super key

Tables will be as following -

- Table-1

Doctor_info

Doc No	Doc Name	Address	Designtn	Charges/hour
D1	Dr Nadeem	Abc 123	Proff.	5000
D2	Dr Nadeem	kb13	Proff.	5000
D4	Dr Erum	AK123	Ass. Proff.	3000
⋮	⋮	⋮	⋮	⋮

- Table-2

Doctor_phone

D_phone id	Doc NO	Phone No
1	D1	0333-123
2	D1	042, 123
3	D2	0334-124
4	D4	0321-123
⋮	⋮	⋮

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- Table-3

Doct_dept_info

Ddept id	Doc No	Dep id
1	D1	Neurology
2	D2	Orthopedic
3	D4	ENT
⋮	⋮	⋮

- Table-4

Patient Table

Patient No	Pat. Name	CNIC	Phone
P1	Kahlid	12345-1	042-1
P5	Ahmed	12345-2	042-2
P7	Anum	12345-3	042-3
⋮	⋮	⋮	⋮

- Table-5

Doc_patient table

Docspc

Doc_pat id	Doc No	Patient No	Admitted
1	D1	P1	Yes
2	D1	P5	Yes
3	D1	P7	No
⋮	⋮	⋮	⋮

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- Table - 6

Room details table

Bed_No	Room No	Room Type
B1	R2	Normal
B5	R4	Two bed
B7	R4	Two bed
B8	R5	Special
B9	R6	Special

- Table - 7

Doc_pat_bed table

DPD_id	Doc_pat id	Bed No.
1	1	B1
2	2	B1
3	4	B5
⋮	⋮	⋮

Now it satisfies condition of BCNF.