

## Assignment RDBMS

### Problem Statement:

**N&N** Hospital is facing problems in its data organization. As database analyst, you have to normalize following N&N Hospital data up to **4NF**. Elaborate each step you perform with logic and state clearly any other **VALID** assumption that you make.

Doc no.	Name	Address	Phone	Department Id	Designation	Charges Per hour	Patient No.	Patient Name	CNIC	Phone	Room No.	Room Type	Bed No.
D1	Dr.Nadeem	Abc 123	0333-123, 042-123	Neurology	Professor	5000	P1	Kahlid	12345-1	042-1	R2	Normal	B1
							P5	Ahmed	12345-2	042-2			
							P7	Anum	12345-3	042-3	Nil		Nil
D2	Dr.Nadeem	Kb13	0334-124, 0300-123	Orthopedic	Professor	5000	P4	Mehmood	12345-4	042-4	R2	Normal	B1
							P7	Anum	12345-3	042-3	R4	Two bed	B5
							P9	Khawar	12345-6	042-5			B7
D4	Dr.Erum	Ak123	0321-123	ENT/ Neurology	Astt. Professor	3000	P10	Tanweer	12345-7	042-6	Nil		Nil
D5	Dr.Hafeez	Nd123	0321-124	Skin/ Orthopedic	Astt. Professor	3000	P1	Khalid	12345-1	042-1	R5	Special	B8
							P12	Sohail	12345-9	042-8	Nil		Nil
							P13	Ahmed	12346-0	042-9	R6	Special	B9

### Solution:

#### First Normal Form 1 NF

For a table to be in the First Normal Form, it should follow the following 4 rules:

1. It should only have single(atomic) valued attributes/columns.
2. Values stored in a column should be of the same domain
3. All the columns in a table should have unique names.
4. And the order in which data is stored, does not matter.

Doc No	Name	Address	Designation	Charges
D1	Dr Nadeem	Abc 123	Professor	5000
D2	Dr Nadeem	Kb13	Professor	5000
D4	Dr Erum	Ak123	Astt Professor	3000
D5	Dr Hafeez	Nd123	Astt Professor	3000

Table1

Doc No	Phone No
D1	0333-123
D1	042-123
D2	0334-124
D2	0300-123
D4	0321-123
D5	0321-124

Table 2

Doc No	Department Id
D1	Neurology
D2	Orthopedic
D4	EnT
D4	Neurology
D5	Skin
D5	Orthopedic

Table 3

Patient No	Doc No	Patient Name	CNIC	Phone	Room No	Room Type	Bed No.
P1	D1	Kahlid	12345-1	042-1	R-2	Normal	B1
P1	D4	Kahlid	12345-1	042-1	R-5	Special	B9
P5	D1	Ahmed	12345-2	042-2	Nil		Nil
P7	D1	Anum	12345-3	042-3	R-2	Normal	B1
P7	D2	Anum	12345-3	042-3	R-4	Two Bed	B5
P4	D2	Mehmood	12345-4	042-4	R-2	Normal	B1
P9	D2	Khawar	12345-6	042-5	R-4	Two Bed	B7
P10	D4	Tanweer	12345-7	042-6	Nil		Nil
P12	D5	Sohail	12345-9	042-8	Nil		Nil
P13	D5	Ahmed	12345-0	042-9	R6	Special	B9

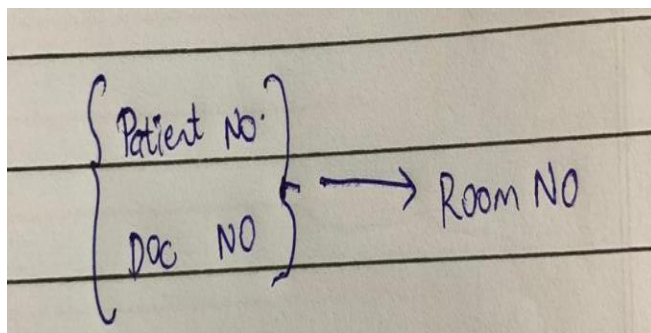
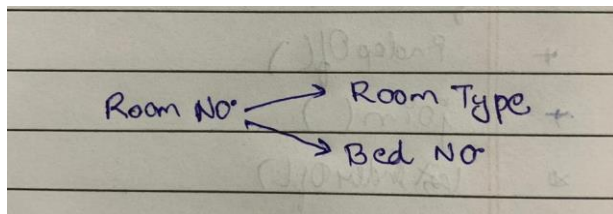
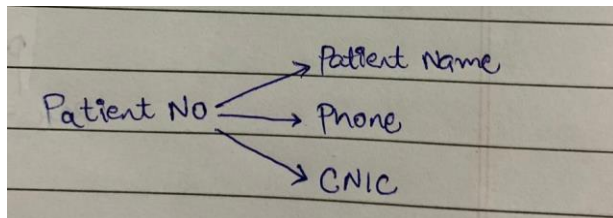
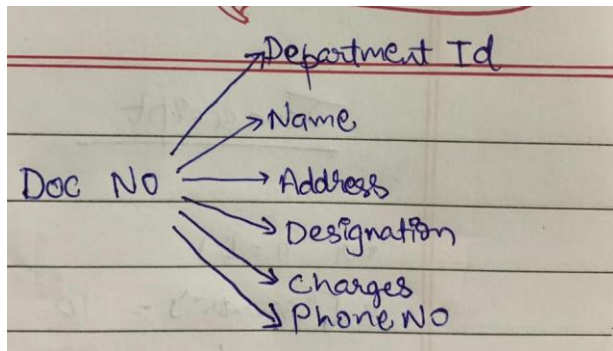
Table 4

## Second Normal Form 2NF

For a table to be in the Second Normal Form,

1. It should be in the First Normal form.
2. And, it should not have Partial Dependency..

## Dependencies



CANDIDATE KEY: Patient No, Doc No

Partial Dependency exists in the Table 4. Therefore splitting the table to remove the partial dependency.

Patient No	Patient Name	CNIC	Phone
P1	Kahlid	12345-1	042-1
P1	Kahlid	12345-1	042-1
P5	Ahmed	12345-2	042-2
P7	Anum	12345-3	042-3
P7	Anum	12345-3	042-3
P4	Mehmood	12345-4	042-4
P9	Khawar	12345-6	042-5
P10	Tanweer	12345-7	042-6
P12	Sohail	12345-9	042-8
P13	Ahmed	12345-0	042-9

Table 5

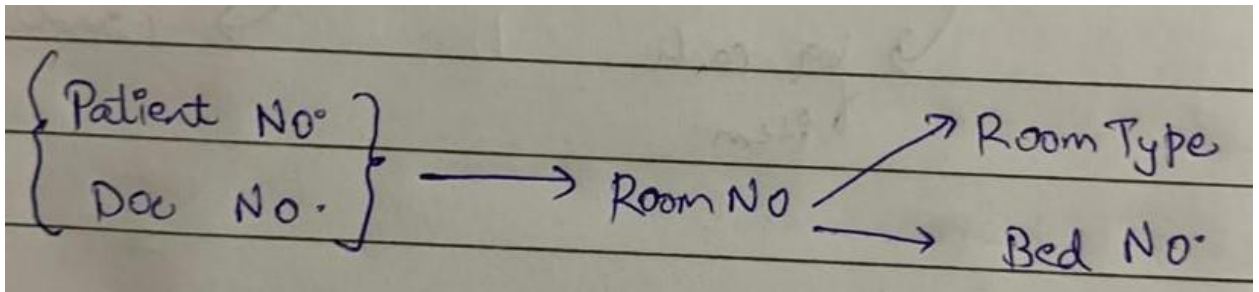
Patient No	Doc No	Room No	Room Type	Bed No.
P1	D1	R-2	Normal	B1
P1	D4	R-5	Special	B9
P5	D1	Nil		Nil
P7	D1	R-2	Normal	B1
P7	D2	R-4	Two Bed	B5
P4	D2	R-2	Normal	B1
P9	D2	R-4	Two Bed	B7
P10	D4	Nil		Nil
P12	D5	Nil		Nil
P13	D5	R6	Special	B9

Table 6

### Third Normal Form 3NF

A table is said to be in the Third Normal Form when,

1. It is in the Second Normal form.
2. And, it doesn't have Transitive Dependency.



Transitive Dependency

Room No	Room Type	Bed No.
R-2	Normal	B1
R-5	Special	B9
Nil		Nil
R-2	Normal	B1
R-4	Two Bed	B5
R-2	Normal	B1
R-4	Two Bed	B7
Nil		Nil
Nil		Nil
R6	Special	B9

Table 7

Patient No	Doc No	Room No
P1	D1	R-2
P1	D4	R-5
P5	D1	Nil
P7	D1	R-2
P7	D2	R-4
P4	D2	R-2
P9	D2	R-4
P10	D4	Nil
P12	D5	Nil
P13	D5	R6

Table 8

## Resultant Tables

Doc No	Name	Address	Designation	Charges
D1	Dr Nadeem	Abc 123	Professor	5000
D2	Dr Nadeem	Kb13	Professor	5000
D4	Dr Erum	Ak123	Astt Professor	3000
D5	Dr Hafeez	Nd123	Astt Professor	3000

Doc No	Phone No
D1	0333-123
D1	042-123
D2	0334-124
D2	0300-123
D4	0321-123
D5	0321-124

Doc No	Department Id
D1	Neurology
D2	Orthopedic
D4	EnT
D4	Neurology
D5	Skin
D5	Orthopedic

Patient No	Patient Name	CNIC	Phone
P1	Kahlid	12345-1	042-1
P1	Kahlid	12345-1	042-1
P5	Ahmed	12345-2	042-2
P7	Anum	12345-3	042-3
P7	Anum	12345-3	042-3
P4	Mehmood	12345-4	042-4
P9	Khawar	12345-6	042-5
P10	Tanweer	12345-7	042-6
P12	Sohail	12345-9	042-8
P13	Ahmed	12345-0	042-9

Room No	Room Type	Bed No.
R-2	Normal	B1
R-5	Special	B9
Nil		Nil
R-2	Normal	B1
R-4	Two Bed	B5
R-2	Normal	B1
R-4	Two Bed	B7
Nil		Nil
Nil		Nil
R6	Special	B9

Patient No	Doc No	Room No
P1	D1	R-2
P1	D4	R-5
P5	D1	Nil
P7	D1	R-2
P7	D2	R-4
P4	D2	R-2
P9	D2	R-4
P10	D4	Nil
P12	D5	Nil
P13	D5	R6