

# DBMS Assignment - 6

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Date

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- ① The table is not in 1NF because the attribute Courses contains more than one value for each ID. Courses  $\rightarrow$  OS, DBMS.  
So it is not in 1NF if it can be in 2NF & 3NF.

Converted Table:

ID	Name	Age	Location	Courses
1	Sachin	22	Delhi	OS
1	Sachin	22	Delhi	DBMS
2	Ram	22	Jamshedpur	DAA
2	Ram	22	Jamshedpur	DBMS
3	Mike	23	Chennai	ML
3	Mike	23	Chennai	OS
4	Sameer	21	Bengaluru	DAA
4	Sameer	21	Bengaluru	ML
5	Vijay	22	Mumbai	ML
5	Vijay	22	Mumbai	DBMS

$\rightarrow$  The above Table is in 1NF

$\rightarrow$  Prime Attributes  $\rightarrow$  ID & Name  
Non-Prime  $\rightarrow$  Age, Location, Courses.

$\rightarrow$  FD  $\rightarrow$  ID  $\rightarrow$  Age, Location, Courses.



\* The 2<sup>nd</sup> table provided in the question is already in a 2NF so need to convert.

② This is not in 2NF because there is partial dependency of Duty-Shift-ID → Duty-Shift. for a table to be in 2NF, all the non key attributes should be functionally dependent on the entire primary key.

The primary key is {Emp-ID, Duty-Shift-ID} But {Duty-Shift-ID} → Duty-Shift, Hence partial dependency exists.

2NF would be primary keys

	Emp-ID	Duty-Shift-ID	Name	Age
	101	1	Arun	26
Name, age	102	2	Bobby	28
are non-	103	3	Suresh	32
prime	104	1	Sita	24
attributes				

	Duty-Shift-ID	Duty-Shift
Duty-Shift is non-prime attribute	1	Morning
	2	Afternoon
	3	Night



⑥ This is not in 2NF because there exists partial dependency

$\{ \text{Project-ID} \} \rightarrow \{ \text{Proj-Name} \}$

The primary key is  $\{ \text{Emp-ID}, \text{Project-ID} \}$   
 All the non-prime attributes name, Proj-name, no.o.p-hours should completely depend on primary key.  
 2NF would be

Emp-ID	Project-ID	Name	No.o.p.hours
123	Prj-21	Ajay	10
321	Prj-45	Charu	15
546	Prj-24	Rajesh	23
765	Prj-11	Abhishek	16

$\{ \text{Emp-ID}, \text{Project-ID} \} \rightarrow \text{Primary Key}$

Project-ID	Proj-name
Prj-21	Speech-System
Prj-45	IR System
Prj-24	Automatic tickets
Prj-11	N/C P.

$\{ \text{Project-ID} \} \rightarrow \text{Primary Key}$



- ⑧ ⑥ Not in 3NF, there exists transitive dependency between {Cust-Address} & {Cust-Post Code}.  
3NF would be

Cust-ID	Cust-Name	Cust-PostCode
25	Dell	560037
45	Lenovo	560046
99	Acer	210067
90	Samsung	4500078

{Cust-ID} → Primary Key

Cust-PostCode	Cust-Address	Cust-Loc
560037	Whitefield	Bangalore
560046	Marathahalli	Bangalore
210067	Bandra	Mumbai
4500078	Delhi Central	Delhi

{Cust-PostCode} → Primary Key

- ⑨ Here, there exists transitive dependency, so, it is not in 3NF.

{Contractor} → {fee}

There should be no transitive dependency in 3NF

{Building} → Primary Key

{ Contractor, Builder, fee } →

non-prime  
attribute

SNF would be

Building	Contractor	Builder
B-2156	Taylor	Prestige
B-8765	Sandeep	Hiranandani
B-4567	Vishalca	Tata

Primary key - { Contractor, fee }

Contractor	fee
Taylor	256 7891
Sandeep	356 7356
Vishalca	456 7990