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DBMS - Assignment - 6

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1A)

- * This table is not in 1NF because course column has multiple attributes. For a table to be in 1NF it should contain only atomic values. Here 'Id' is the primary key.

Prime Attribute - Id

Non-Prime Attribute - Name, Age, Location.

Functional dependency :-

$$Id \rightarrow \text{course, name, age, Location}.$$

Converted 1NF table:-

Id	Name	Age	Location	Course
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	DSMS

* This is already in 1st Normal form (1NF). No need to convert as it doesn't have any multiple attributes & unique column names.

2A)

* It is not in 2NF because it is not functionally independent.

$\text{Duty-shift-ID} \rightarrow \text{Duty-shift}$

Primary key - Emp-ID

Prime Attributes - Emp-ID, Duty-shift-ID

Non-Prime Attributes - Name, Age, Duty-shift.

Candidate keys - Emp-ID, Duty-shift-ID

Converted 2NF Table:-

Table 1:-

Emp-ID	Name	Age
101	Arun	26
102	Bobby	28
103	suresh	32
104	sita	24

Table 2:-

Emp-ID	Duty-shift-ID	Duty-shift
101	1	morning
102	2	Afternoon
103	3	night
104	1	morning.

* This is also not in 2NF as it is not fully functionally independent.

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

$\text{Emp-ID} \rightarrow \text{Name}$

Primary key - Emp-ID

Candidate keys - Emp-ID , Project-ID

Prime attributes - Emp-ID , Project-ID .

Non-Prime attributes - Name , Proj-Name , No.-of-hours .

Converted 2NF Table:-

Emp-ID	Name
123	Ajay
321	Chary
546	Rajesh
765	Abhishek.

Emp-ID	Project-ID	Proj-Name	No.-of-hours
123	Prj-21	Speech-System	10
321	Prj-45	HR System	15
546	Prj-24	Automate Tickets	23
765	Prj-11	NLP	16

3A)

- * Here there exist transitive dependency. So it is not in 3NF

Transitive dependency:-

cust-postcode \rightarrow custloc, cust-address.

Primary key - cust-ID

cust-ID	cust-name	cust-postcode
25	Dell	560037
45	Lenovo	560046
89	Acer	210067
90	Samsung	4500078

cust-Postcode	cust-address	cust-loc
560037	whitefield	Banglore
560046	Marathahalli	Banglore
210067	Bandra	Mumbai
4500078	Delhi central.	Delhi

* Here transitive dependency exists. There should be no transitive dependency for table to be in third Normal form.

building → Contractor, builder.

Contractor → fee.

Primary key - building

Prime Attribute - building

Non-Prime Attributes - Contractors, builder, fee.

building is transitively dependent on fee.

Converted 3NF Table:-

Building	Contractor	Builder
B-2156	Taylor	Prestige
B-8765	Sandeep	Hiranandani,
B-4567	Vishaka	Tata.

Contractor	fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990