06/04/21

* Lab - 6 *

* Assignment - Normalization *

Name - Param D. Mane

R.No. - 19BCS121

1) i) This table is not in 1nf because in the 'course' column has multiple values, but for a table to be in 1nf it must contain only atomic value at each row & column. Here the attribute 'Id' is the primary key and condidate key. The attributes 'Name', 'Age', 'Location', 'course', are non-prime attributes. 'Id' is the prime attribute.

The 1nf be,

Id	Name	Age	Location
1	Sachin	22	Delhi
2	Ram	22	Jamshedpur
3	Mike	23	Chennai
4	Sameer	21	Bengaluru
5	Vijay	22	Mumbai

Id	Course
1	OS
1	DBMS
2	DAA
2	DBMS
3	ML
3	OS
4	DAA
4	ML
5	ML
5	DBMS

∴ {Id, Course} is the primary key.

ii) This table is already in 1nf because here are no multivalued attributes, here 'Id' is the primary key and 'Name', 'Phone', 'State', 'Country' are not.

2) i) This is not in 2nf because there is partial dependency {Duty_shift_ID} → Duty_shift. For a table to be in 2nf all the non-prime key attributes should be functionally dependent on the entire primary key. Here the primary key is {Emp_ID, Duty_shift_ID} but {Duty_shift_ID} → Duty_shift

Hence, Partial dependency exists ⇒ Not in 2nf.

2nf be,

P.K

Emp_ID	Duty_shift_ID	Name	Age
101	1	Arun	26
102	2	Bobby	28
103	3	Suresh	32
104	1	Sita	24

{Name, Age} are non-prime attributes

P.K

Duty_shift_ID	Duty_shift
1	Morning
2	Afternoon
3	Night

Here Duty_shift is non-prime attribute.

ii) This is not in 2nf because, the partial dependency exists.

{Project_ID} → {Proj_Name}

The primary key is {Emp-ID, Project_ID}. All the non-prime attributes, 'Name', 'Proj_Name', 'No_of_hours', should completely depend on entire primary key.

2nf be,

P.K

Emp-ID	Project-ID	Name	No_of_hours
123	Proj-21	Ajay	10
321	Proj-45	Charu	15
546	Proj-24	Rajesh	23
765	Proj-11	Abhishek	16

{Emp-ID, Project_ID} → P.Key.

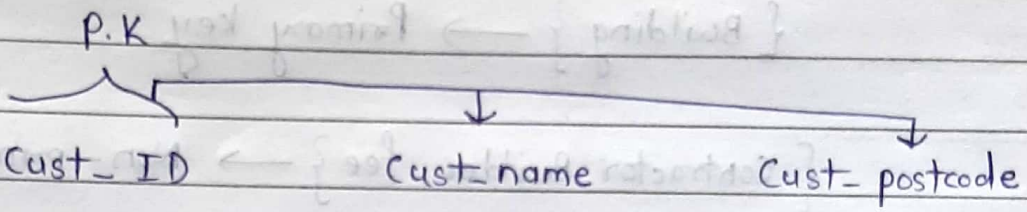
PK

Project_ID	Proj_Name
Proj-21	Speech_system
Proj-45	HR system
Proj-24	Automate Tickets
Proj-11	NLP

{Project_ID} → Primary key (P.K.)

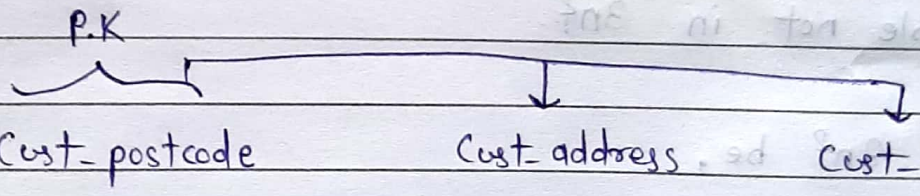
3) i) This table is not in 3nf because, there exists transitive dependency between {Cust_address} & {Cust_loc}, on a non-primary key which is {Cust_postcode}.

3nf be,



25	Dell	560037
45	Lenovo	560046
89	Acer	210067
90	Samsung	4500078

∴ {Cust_ID} → P.Key.



560037	Whitefield	Banglore
560046	Marathahalli	Banglore
210067	Bandra	Mumbai
4500078	Delhi central	Delhi.

{Cust_postcode} → Primary key (P.K.).

ii) This table is not in 3nf because, there exists transitive dependency

{ Contractor } → { fee }

but there should not be transitive dependency in 3nf.

{ Building } → Primary key

{ Contractor, Builder, fee } → Non-prime att.

{ Building } → { Contractor }

{ Building } → { Builder }

{ Contractor } → { fee }

∴ Table not in 3nf.

3nf be,

Building (Primary key)	Contractor	Builder
B-2156	Taylor	Prestige
B-8765	Sandeep	Hiranandani
B-4567	Vishaka	Tata

P.K

Contractor	fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990

Primary key → {Contractor}.