

CS3095D DBMS LAB

EXERCISE NO:5

Normalisation:

The process of organizing the data in database. This avoids data redundancy, insertion anomaly, update anomaly and deletion anomaly.

In this , we apply normalization theory and normalize the tables into 1NF, 2NF, 3NF.

(a)First normal form(1NF)

(b)Second normal form(2NF)

(c)Third normal form(3NF)

First normal form(1NF):

The first normal form (1NF) is a property of a relation in a relational database. A relation is in first normal form if and only if the domain of each attribute contains only atomic values. As per the rule of first normal form, each attribute contains only a single value from that domain.

Second Normal form(2NF):

A table is said to be in 2NF if both the following conditions hold:

- a. Table is in First normal form (1NF)
- b. Table should not contain any Partial dependencies.

Third Normal form(3NF):

A table design is said to be in 3NF if both the following conditions hold:

- Table must be in the second normal form (2NF)
- Table should not hold any transitive dependencies.

TABLE 1:Users table

****1NF:**

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	User_name	Email	Mobile	Address
<input type="checkbox"/>	AB Devillers	abd27abdul@yahoo.com	8123456789	New colony,Ganagdar,512456,Gujarat
<input type="checkbox"/>	Devdutt	devduttpd31@gmail.com	9503544668	Jogaya colony,Allambad,513567,Mumbai
<input type="checkbox"/>	hepsi123	hepsivk@yahoo.com	9876543210	KOTHAPETA,Narsapur,534261,Andhra Pradesh
<input type="checkbox"/>	Venu_vk_18	venukarpuram04@mkn.com	9987654321	Gandhinagar,vizag,534250,Andhra Pradesh
<input type="checkbox"/>	virat_kohli	vk1805virat@ghm.com	8328260660	Newliving street, vijaywada,534278,Andhra pradesh

☐ Check all | With selected: Edit Copy Delete Export

In this Users table column named Address holds multiple/composite values which is a violation to 1NF. So reduce the column Address into atomic values.

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	User_name	Email	Mobile	Street	City	State	Pincode
<input type="checkbox"/>	AB Devillers	abd27abdul@gmail.com	8123456789	New colony	Gangadar	Gujarat	512456
<input type="checkbox"/>	Devdutt	devduttpd31@gmail.com	9503544668	Jogaya colony	Allambad	Mumbai	513567
<input type="checkbox"/>	hepsi123	hepsivk@yahoo.com	9876543210	KOTHAPETA	Narsapur	Andhra Pradesh	534261
<input type="checkbox"/>	Venu_vk_18	venukarpuram04@mkn.com	9987654321	Gandhinagar	vizag	Andhra Pradesh	534250
<input type="checkbox"/>	virat_kohli	vk1805virat@ghm.com	8328260660	Newliving street	vijaywada	Andhra Pradesh	534278

☐ Check all | With selected: Edit Copy Delete Export

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Query results operations

The above table satisfies 1NF condition since all the columns holds only atomic values.

****2NF:**

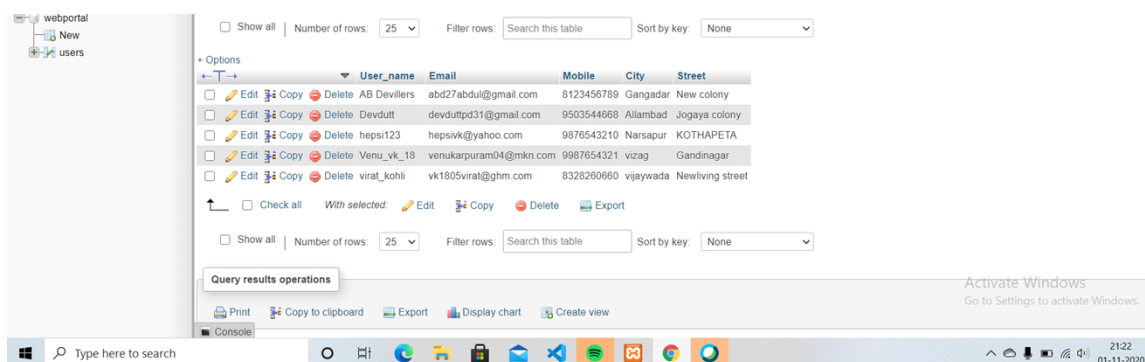
Here there are no partial dependencies of the primary key. Every non-prime attribute is either fully dependent. So, it satisfies the 2NF Form.

****3NF:**

Now our table follows 2NF and we need to check for the existence of transitive dependencies to claim our table follows 3NF.

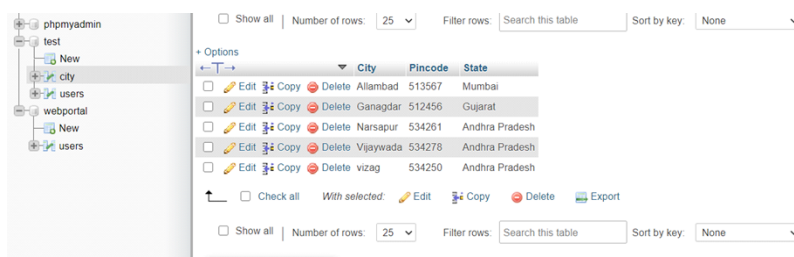
If we observe the above table, we can clearly notice that the attributes Pincode, state depends on the attribute city which is a non-prime attribute. Thus our table violates 3NF.

To remove this redundancy we need to remove all the transitive dependents from our table and place them in a new table called City_Table in which the primary key is city which is referenced by the foreign key city in Users table.



	User_name	Email	Mobile	City	Street
<input type="checkbox"/>	AB Devillers	abd27abdu@gmail.com	8123456789	Gangadar	New colony
<input type="checkbox"/>	Devdutt	devdutt31@gmail.com	9503544668	Allambad	Jogaya colony
<input type="checkbox"/>	hepsi123	hepsi123@yahoo.com	9876543210	Narsapur	KOTHAPETA
<input type="checkbox"/>	Venu_vk_18	venukarapuram04@mkn.com	9987654321	vizag	Gandhinagar
<input type="checkbox"/>	virat_kohli	vk1805virat@ghm.com	8328260660	vijaywada	Newliving street

Users table



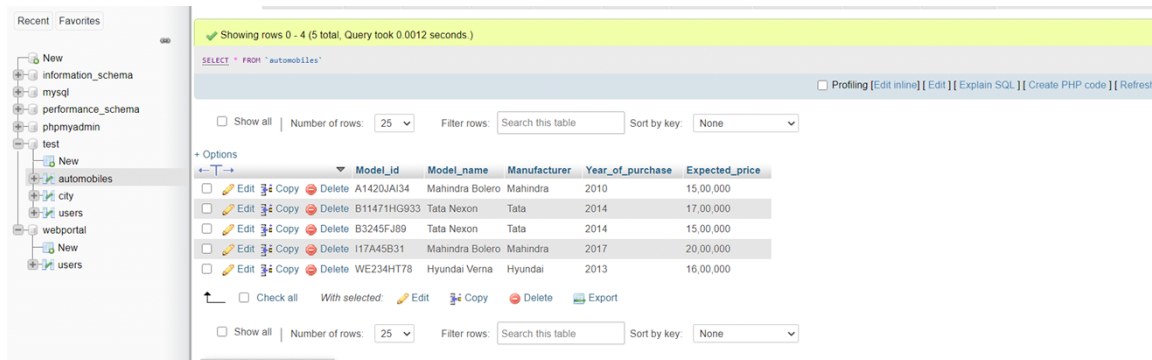
	City	Pincode	State
<input type="checkbox"/>	Allambad	513567	Mumbai
<input type="checkbox"/>	Ganagdar	512456	Gujarat
<input type="checkbox"/>	Narsapur	534261	Andhra Pradesh
<input type="checkbox"/>	Vijaywada	534278	Andhra Pradesh
<input type="checkbox"/>	vizag	534250	Andhra Pradesh

City table

With this all the transitive dependents are also removed from our table and it still obeys 2NF.

So now we can say that our table satisfies 3NF

TABLE 2: Vehicle Table



Showing rows 0 - 4 (5 total, Query took 0.0012 seconds.)

SELECT * FROM `automobiles`

Options: Show all, Number of rows: 25, Filter rows: Search this table, Sort by key: None

	Model_id	Model_name	Manufacturer	Year_of_purchase	Expected_price
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	A1420JAI34	Mahindra Bolero	Mahindra	2010	15,00,000
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	B11471HG933	Tata Nexon	Tata	2014	17,00,000
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	B3245FJ89	Tata Nexon	Tata	2014	15,00,000
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	I17A45B31	Mahindra Bolero	Mahindra	2017	20,00,000
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	WE234HT78	Hyundai Verna	Hyundai	2013	16,00,000

Options: Check all, With selected, Edit, Copy, Delete, Export

Show all, Number of rows: 25, Filter rows: Search this table, Sort by key: None

****1NF:**

Table Vehicle satisfies 1NF since all the columns in the table are holding only atomic values.

****2NF:**

Table Vehicle violates 2NF since there exists a partial dependency in our table.

In the table vehicle primary key is composite key which is composed of {Model_id ,Model_name} and it is clear from the table that the attribute

Manufacturer depends only on ModelName ,so there arises a partial dependency in the table which is a violation for 2NF.

To remove this redundancy, remove the partial dependent from the vehicle table and add it in a new table called models in which the primary key is Model_name.

The screenshot shows the phpMyAdmin interface. On the left is a sidebar with a tree view of databases and tables. The 'test' database is selected, and the 'manufacturer' table is highlighted. The main panel displays the table's structure and data. At the top, a status bar indicates 'Showing rows 0 - 2 (3 total, Query took 0.0016 seconds)'. Below this, the SQL query 'SELECT * FROM `manufacturer`' is shown. A table with two columns, 'Model_name' and 'Manufacturer', contains three rows of data. Below the table, there are options to check all, edit, copy, delete, and export the data. At the bottom, there is a 'Query results operations' section with links for print, copy to clipboard, export, display chart, and create view.

Model_name	Manufacturer
Hyundai Verna	Hyundai
Mahindra Bolero	Mahindra
Tata Nexon	Tata

Table: ModelName

****3NF:**

Now the table vehicle follows 2NF and also there doesn't exist any transitive dependency in the table vehicle.

So we can say that table vehicle satisfies 3NF.