

Student Name : Santosh Acharya

Student Id : c0930325

Program Code: CSD 2206

Assignment 2

Question of assignment

. Normalize the following table up to Third Normal Form (3NF).

StudentID	Student	ProfID	ProfFirst	ProfLast	Department	Major1	Major2
003-112-224	Alexia Carnell	AKZ	Akram	Aziz	Computer Science	Programming	Web Development
013-112-229	Savanna Sanderlin					Programming	
009-112-227	Buddy Pothier	DOM	Donnell	Meaders	Business	Accounting	
012-111-228	Verline Papadopoulos					Auto Technology	
002-111-223	Buddy Pothier	JJJ	James	Justus	Technology	Welding	

- Note:
- PK-> Primary Key
- FK -> Foreign Key

First Normal Form / 1NF

Requirement / criteria for 1st Normal Form

- ❖ The 1st Normal Form is performed to remove the repeating group, or multivalued columns.

Table complete the below criteria to be 1NF

- ❖ Major 1, Major 2 is repeating group so it is converted to Major.
- ❖ So, the table has been converted to 1NF.
- ❖ **Students(Student_Id , Prof_Id, Student, Prof_First, Prof_Last, Department, Major)**
- ❖ **Student_Id** and **Prof_Id** is composite primary key.

Composite Primary Key		Students				
<u>Student_Id</u>	<u>Prof_Id</u>	Student	Prof_First	Prof_Last	Department	Major
0003-112-224	AKZ	Alexia Carnell	Akram	Aziz	Computer Science	Programming
0003-112-224	AKZ	Alexia Carnell	Akram	Aziz	Computer Science	Web Development
013-112-229	AKZ	Savanna Sanderlin	Akram	Aziz	Computer Science	Programming
009-112-227	DOM	Buddy Pothier	Donnell	Meaders	Business	Accounting
012-111-228	DOM	Verline Papadopoulos	Donnell	Meaders	Business	Auto Technology
002-111-223	JJJ	Buddy Pothier	James	Justus	Technology	Welding

Second Normal Form / 2NF

Requirement / criteria for 2nd Normal Form

- ❖ The table must be in 1NF
- ❖ The 2nd Normal Form is performed when there is composite primary key and partial dependencies.

Table complete the below criteria to be 2NF

- ❖ Table is already in 1NF.
- ❖ There is partial dependency between Student_Id and Prof_Id in 1NF table which has been eliminated in 2NF
- ❖ **Students**(Student_Id, Student)
- ❖ **Professor**(Prof_id, Prof_First, Prof_Last, Department)
- ❖ **Student_Major**(Student_Id, Prof_id, Major)
 - Student_id (FK, PK)->Student_Major
 - Prof_Id (FK,PK)->Student_major

Primary Key

Students

<u>Student_Id</u>	Student
0003-112-224	Alexia Carnell
013-112-229	Savanna Sanderlin
009-112-227	Buddy Pothier
012-111-228	Verline Papadopoulos
002-111-223	Buddy Pothier

Primary Key

Professor

<u>Prof_Id</u>	Prof_First	Prof_Last	Department
AKZ	Akram	Aziz	Computer Science
DOM	Donnell	Meaders	Business
JJJ	James	Justus	Technology

Primary Key, Foreign Key

Student_Major

<u>Student_Id</u>	<u>Prof_Id</u>	Major
003-112-224	AKZ	Programming
0003-112-224	AKZ	Web Development
013-112-229	AKZ	Programming
009-112-227	DOM	Accounting
012-111-228	DOM	Auto Technology
002-111-223	JJJ	Welding

Third Normal Form / 3NF

Requirement / criteria for 3rd Normal Form

- ❖ The table must be in 2nd Normal Form to be converted into 3NF
- ❖ The table should not contain non-key dependencies.

Table complete the below criteria to be 2NF

- ❖ Since table already is in 2NF and table doesn't have contain non-key dependencies in 2NF table. Therefore, the 2NF table is appear to 3NF table also.

Students

<u>Student_Id</u>	Student
0003-112-224	Alexia Carnell
013-112-229	Savanna Sanderlin
009-112-227	Buddy Pothier
012-111-228	Verline Papadopoulos
002-111-223	Buddy Pothier

Professor

<u>Prof_Id</u>	Prof_First	Prof_Last	Department
AKZ	Akram	Aziz	Computer Science
DOM	Donnell	Meaders	Business
JJJ	James	Justus	Technology

Student_Major

<u>Student_Id</u>	<u>Prof_Id</u>	Major
003-112-224	AKZ	Programming
0003-112-224	AKZ	Web Development
013-112-229	AKZ	Programming
009-112-227	DOM	Accounting
012-111-228	DOM	Auto Technology
002-111-223	JJJ	Welding

Whereas the table has completed the requirement for 3NF in 2NF it is consider good normalization because it will reduce data redundancy and reduce the data retrieving time from the database