06/09/2020

Computer Science 2nd Year

Subject :- 'DBMS'

Third Normal form (3NF)

For a table to be in the third Normal form

1) It should be in the second Normal form
2) and it should not have transitive dependency.

So let's use the same example where we have 3 tables, Student, Subject and Score.

Student table

Student Id	name	reg-no	branch	address
10	Akon	07-wy	CSE	Kerla
11	Akon	08-wy	I.T	Gujarat
12	Akon	09-wy	IT	Rajasthan

Subject table

Subject Id	Subject Name	teacher
1	Java	Java Teacher
2	C++	C++ Teacher
3	Php	Php Teacher

Score table

Score_Id	Student_Id	Subject_Id	marks
1	10	1	70
2	10	2	75
3	11	1	80

In the score table, we need to store some more information, which is the exam name and total marks, so let's add 2 more columns to the score table.

Score_Id	Student_Id	Subject_Id	marks
1	10	1	70
2	10	2	75
3	11	1	80

exam name	Total Marks

What is Transitive dependency :-

With exam_name and total_marks added to your Score table, it saves more data now.

Primary key for our score table is a Compoite key, which means it's made up of two attribute or column → Student Id + Subject Id

Our new column exam_name depends on both student and Subject for, example a mechanical engg student will have workshop exam but a Computer Science Student

won't and for some subjects you have practical exams and for some you don't. so we can say that exam-name is dependent on both Student-Id and subject-Id.

And what about our second new column total-marks? Does it depend on our score table's Primary Key.

well, the column total-marks depends on exam-name as with exam type the total score changes. For example, Practicals are of less marks while theory exam are of more marks.

But, exam-name is another column in the score table. It is not a primary key or even a part of the primary key and Total-marks depends on it.

This is transitive dependency when a non prime attribute depends on other non-prime attribute rathers than depending upon the prime attribute or Primary Key

How to remove transitive dependency?

Take out the column exam-name and Total-marks from Score table and Put

them in an Exam table and use the exam-Id whenever required.

Score Table : In 3rd Normal form

Score-Id	Student-Id	Subject-Id	marks	exam Id

The new exam table

Exam.Id	exam-name	Total-marks
1	workshop	200
2	mains	70
3	Praticals	30

Advantage of removing transitive dependency

- Amount of Data duplication is reduced
- Data Integrity achived.

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6/04/2020
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