CSE - 370

Database Systems

Summer'23

Assignment Number: 03

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Section: 09

Answer to the question no. : 1

a) The given scheme is in 1NF because no multivalued or composite attribute or nested relation is present.

b) It is not in 2NF, because FD1 and FD2 are creating partial dependency.
Decomposition to 2NF:

Scheme_1(Project_ID, Project_Title)

Scheme_2(Student_ID, Student_Name, Semester)

Project_Grade_Upgraded(Project_ID, Student_ID, Course, Section, Grade, Submission, Bonus)

c) It is not in 3NF because FD3 and FD4 create transitive dependency.
Decomposition to 3NF:

Scheme_1(Project_ID, Project_Title)

Scheme_2(Student_ID, Student_Name, Semester)

Project_Grade_Upgraded(Project_ID, Student_ID, Course, Section, Submission)

Project_Grade_Upgraded_1(Submission, Bonus)

Project_Grade_Upgraded_2(Course, Section, Grade)

Answer to the question no. : 2

1NF:

It is in 1NF because no multivalued or composite attribute or nested relation is present.

Current Scheme:

Books (AuthorName, BookTitle, Publisher, Price, Year, AuthorAffiliation, Type, Category)

2NF:

It is not in 2NF, because FD1 and FD2 are creating partial dependency.

Normalization:

Scheme_1(AuthorName, AuthorAffiliation)

Scheme_2(BookTitle, Publisher, Price, Type)

Books (AuthorName, BookTitle, Year, Category)

3NF:

It is in 3NF. The 3rd functional dependency is between ‘type’ and ‘category’ but after the normalization step for 2NF, these 2 attributes are in 2 different tables. So, it cannot create any transitive dependency.

Current Scheme:

Scheme_1(AuthorName, AuthorAffiliation)

Scheme_2(BookTitle, Publisher, Price, Type)

Books (AuthorName, BookTitle, Year, Category)