Bagsic, Atheia Klaire
BSCpE 2A

Laboratory Activity 7:

Laboratory Title: Normalization - Third Normal Form (3NF)
Chapter No. and Topic: Chapter 3 - Database Design and Modeling
Discussions:
This activity will guide students through converting a table to the Third Normal Form (3NF) by removing transitive dependencies.

Activity Description:
Normalize a table in 2NF to 3NF by eliminating transitive dependencies.

Objectives:

- Achieve 3NF by eliminating transitive dependencies.

Materials:

- SQL client

Procedure:

1. Start with a 2NF table:

```
sql

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CREATE TABLE Books_2NF (

   BookID INT,

   Title VARCHAR(100),

   Author VARCHAR(100),

   Genre VARCHAR(50),

   PublisherID INT,

   PublisherName VARCHAR(100),

   PublisherAddress VARCHAR(100)

);
```

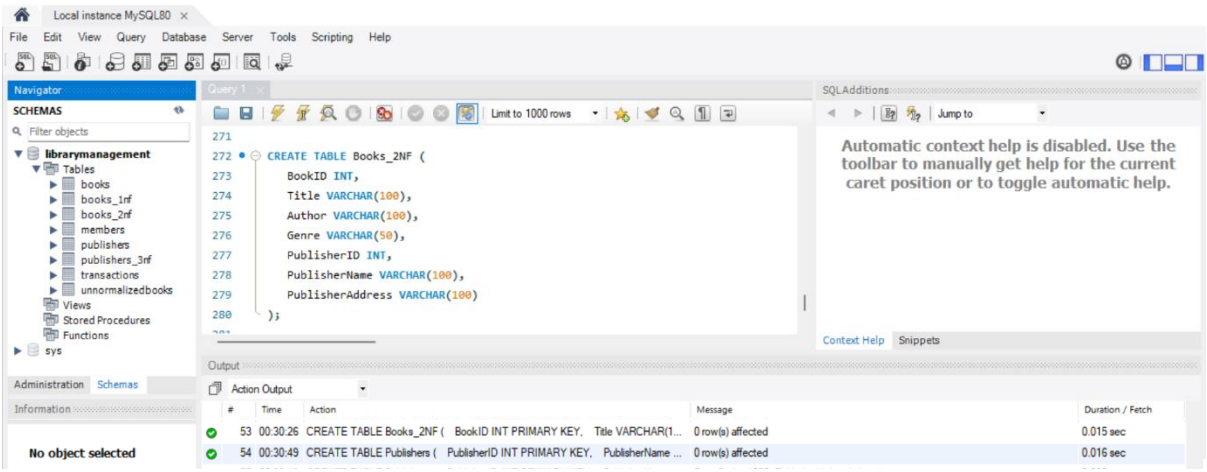

1. Insert data:

```
sql

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INSERT INTO Books_2NF (BookID, Title, Author, Genre,
PublisherID,

PublisherName, PublisherAddress)

VALUES

(1, 'Book A', 'Author1', 'Fiction', 1, 'Publisher1',
'Address1'),

(2, 'Book B', 'Author2', 'Non-Fiction', 1, 'Publisher1',
'Address1');
```

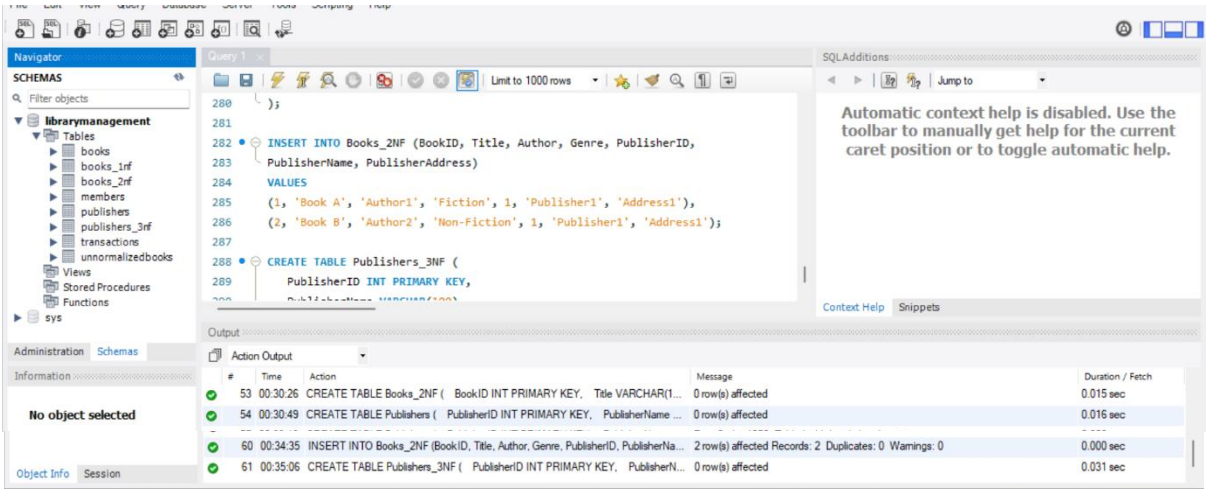

1. Separate publisher details into a new table and link with `PublisherID`:

```
sql

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CREATE TABLE Publishers_3NF (

    PublisherID INT PRIMARY KEY,

    PublisherName VARCHAR(100),

    PublisherAddress VARCHAR(100)

);
```
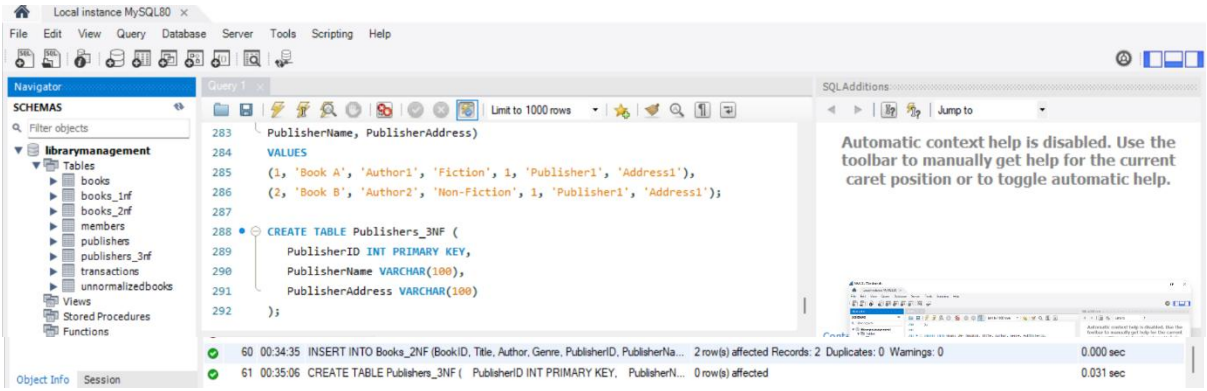
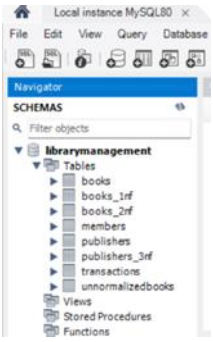



1. Remove `PublisherName` and `PublisherAddress` from `Books_2NF` and adjust the table to use only `PublisherID`.

Result:
The table is now in 3NF, with no transitive dependencies.



Additional Questions/Discussions:

- What are transitive dependencies, and why should they be eliminated?

  - Transitive dependencies occur when a non-key attribute depends on another non-key attribute rather than the primary key. They should be eliminated to ensure data integrity and minimize redundancy.

- How does 3NF improve data integrity?

  - 3NF improves data integrity by eliminating transitive dependencies, ensuring that all non-key attributes depend only on the primary key. This reduces redundancy and enhances data consistency.

Conclusions:

By removing transitive dependencies, I converted a 2NF table into 3NF. This reduced redundancy and improved data consistency, reinforcing the importance of normalization for an efficient database.