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**BSCpE - 2A**

### **Laboratory Activity 6:**

**Laboratory Title:** Normalization - Second Normal Form (2NF)

**Chapter No. and Topic:** Chapter 3 - Database Design and Modeling

#### **Discussions:**

This activity will cover the process of converting a table to the Second Normal Form (2NF).

#### **Activity Description:**

Given a 1NF table, remove partial dependencies to achieve 2NF.

#### **Objectives:**

- Remove partial dependencies and achieve 2NF.

#### **Materials:**

- SQL client

#### **Procedure:**

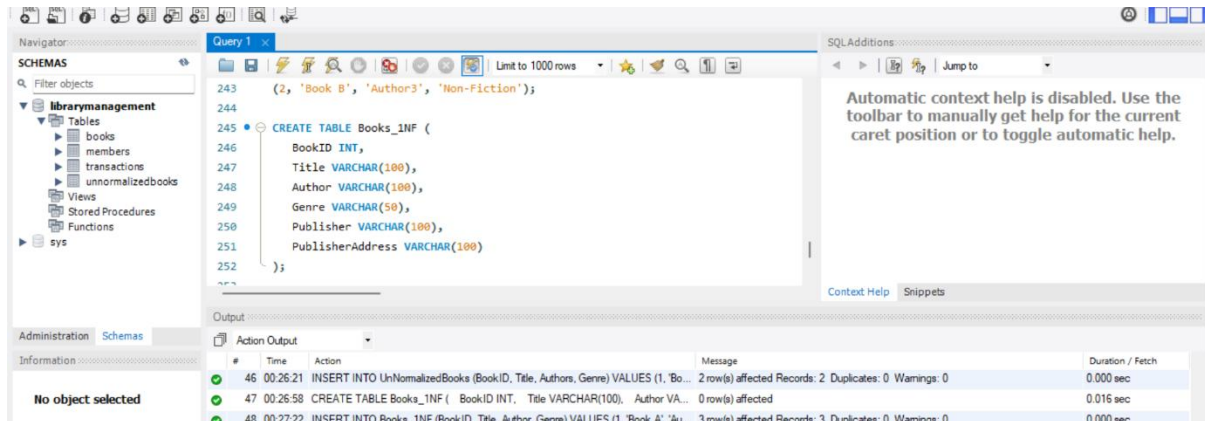
1. Create a 1NF table:

sql

Copy code

```
CREATE TABLE Books_1NF (  
    BookID INT,  
    Title VARCHAR(100),  
    Author VARCHAR(100),  
    Genre VARCHAR(50),  
    Publisher VARCHAR(100),  
    PublisherAddress VARCHAR(100)
```

);



### 1. Insert sample data:

sql

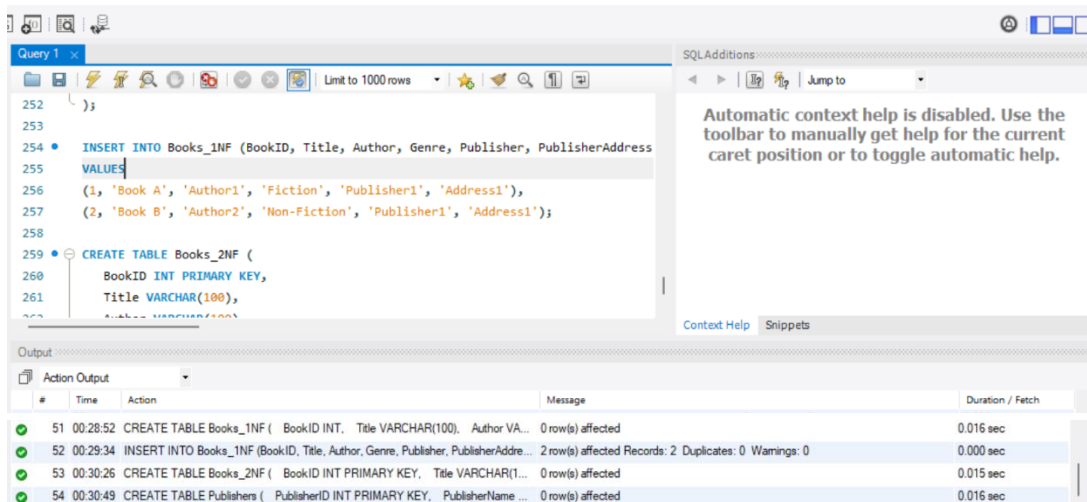
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```
INSERT INTO Books_1NF (BookID, Title, Author, Genre, Publisher, PublisherAddress)
```

```
VALUES
```

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

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



### 1. Create two separate tables to remove partial dependency:

sql

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```
CREATE TABLE Books_2NF (
```

```
    BookID INT PRIMARY KEY,
```

```
    Title VARCHAR(100),
```

```
    Author VARCHAR(100),
```

```
    Genre VARCHAR(50)
```

```
);
```

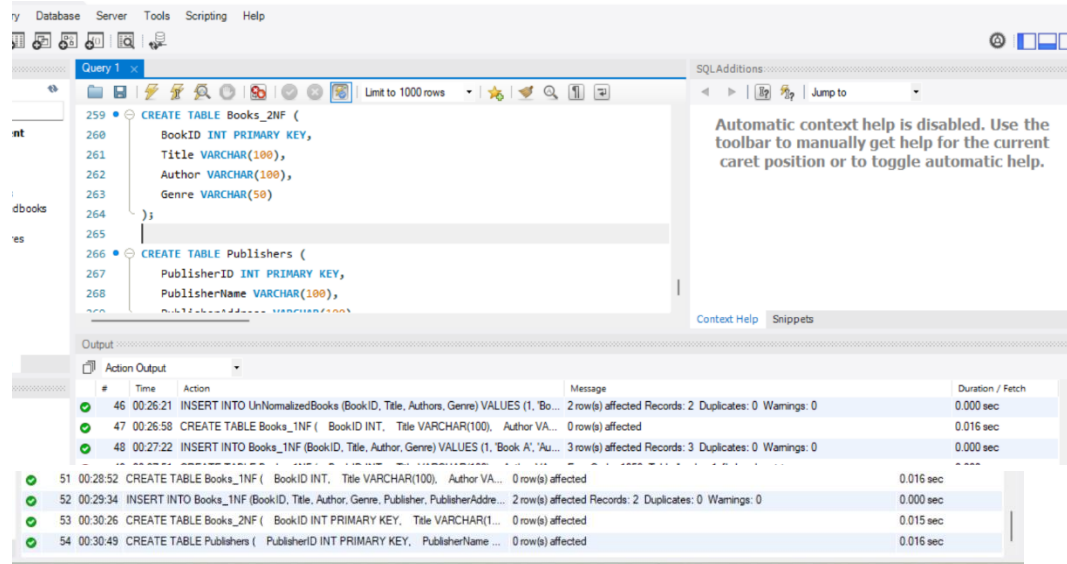
```
CREATE TABLE Publishers (
```

```
    PublisherID INT PRIMARY KEY,
```

```
    PublisherName VARCHAR(100),
```

```
    PublisherAddress VARCHAR(100)
```

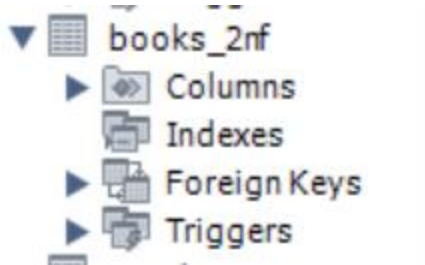
```
);
```



1. Move Publisher data into the Publishers table and adjust Books\_2NF to include PublisherID as a foreign key.

### Result:

The table is now in 2NF with no partial dependencies.



### **Additional Questions/Discussions:**

- What is a partial dependency, and how does 2NF eliminate it?
  - A partial dependency occurs when a non-key attribute depends on part of a composite primary key. 2NF eliminates it by ensuring all non-key attributes depend on the whole primary key, not just a part of it.
- How do foreign keys help maintain data integrity?
  - Foreign keys maintain data integrity by ensuring relationships between tables remain valid, preventing invalid or orphaned records.

### **Conclusions:**

This lab showed the importance of eliminating partial dependencies for 2NF. By moving publisher information to a new table, I reduced duplication and improved organization. It also highlighted how foreign keys maintain table relationships.