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BSCoE – 2B2

DATABASE MANAGEMENT SYSTEM

Laboratory Activity 5:

Laboratory Title: Normalization - First Normal Form (1NF)
Chapter No. and Topic: Chapter 3 - Database Design and Modeling
Discussions:
This activity demonstrates how to normalize a table to the First Normal Form (1NF).

Activity Description:
Given a sample non-normalized table, convert it to 1NF by ensuring that all columns contain atomic values.

Objectives:

- Understand how to apply 1NF to a database design.
- Convert a table into 1NF.

Materials:

- SQL client

Procedure:

1. Start by creating a sample non-normalized table:

sql

Copy code

```
CREATE TABLE UnNormalizedBooks (
  BookID INT,
  Title VARCHAR(100),
  Authors VARCHAR(100),
  Genre VARCHAR(50)
);
```

1. Insert data into the table:

sql

Copy code

```
INSERT INTO UnNormalizedBooks (BookID, Title, Authors, Genre)
VALUES
(1, 'Book A', 'Author1, Author2', 'Fiction'),
(2, 'Book B', 'Author3', 'Non-Fiction');
```

1. Convert to 1NF by creating separate rows for multiple authors:

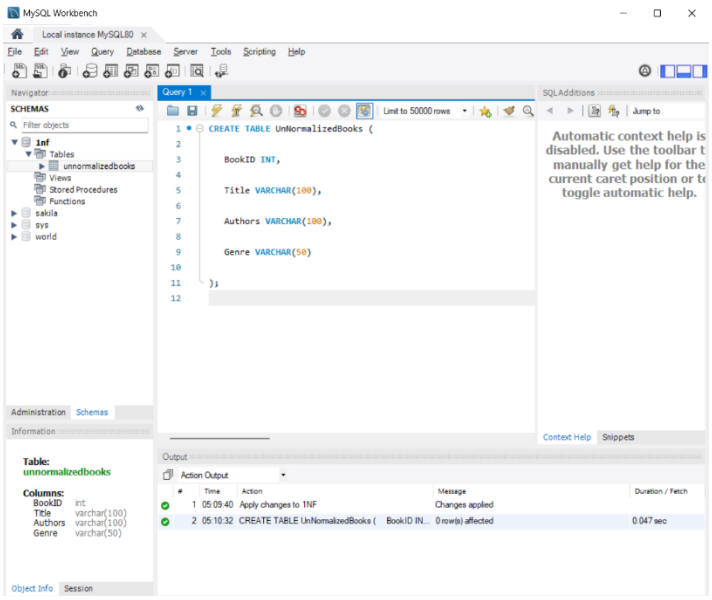
```
sql
Copy code
CREATE TABLE Books_1NF (
  BookID INT,
  Title VARCHAR(100),
  Author VARCHAR(100),
  Genre VARCHAR(50)
);
```

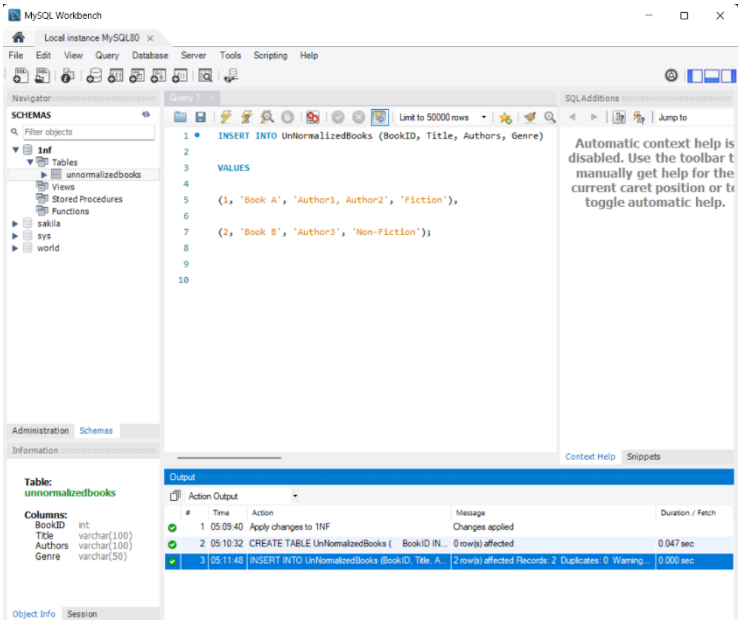
1. Insert normalized data:

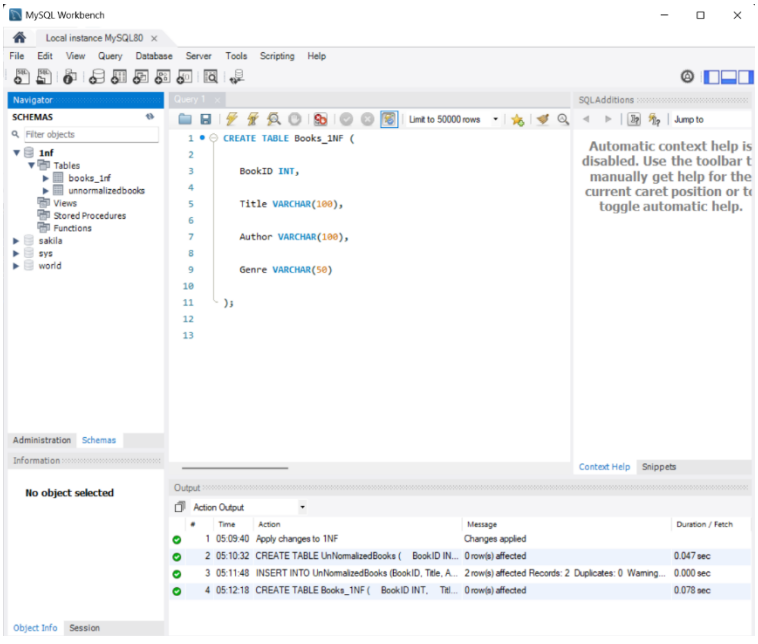
```
sql
Copy code
INSERT INTO Books_1NF (BookID, Title, Author, Genre)
VALUES
(1, 'Book A', 'Author1', 'Fiction'),
(1, 'Book A', 'Author2', 'Fiction'),
(2, 'Book B', 'Author3', 'Non-Fiction');
```

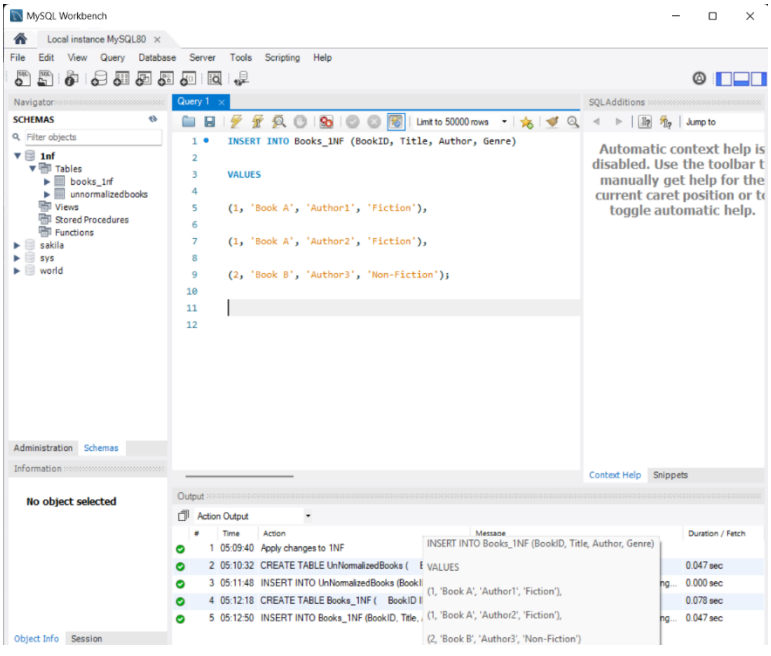
Result:

The table is now in 1NF with atomic values for each column.









Additional Questions/Discussions:

- How does 1NF improve data integrity?

  ANSWER:

  1NF improves data integrity by ensuring each column contains atomic values, preventing redundancy and inconsistency.

- What are atomic values, and why are they important?

  ANSWER:

  Atomic values are indivisible data entries that ensure accurate and consistent storage without data duplication or ambiguity.

Conclusions:

Answer:

- **1NF** ensures that each column contains only atomic values, eliminating duplicate data and ensuring data consistency.
- **Normalization** helps to reduce data redundancy and anomalies by organizing data into simpler structures.
- By converting tables into **1NF**, databases become more efficient and easier to maintain.