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BSCpE 3A   DBMS

Laboratory Activity 2:

Laboratory Title: Creating Tables and Establishing Primary Keys
Chapter No. and Topic: Chapter 1 - Relational Database Concepts
Discussions:
This activity focuses on creating the main tables for the Library Management System, with primary keys for each table.

Activity Description:
Create tables such as `Books`, `Members`, and `Transactions` for the library system.

Objectives:

- Create tables for library management.
- Define primary keys for each table.

Materials:

- MySQL Workbench or SQL client

Procedure:

1. Open MySQL Workbench and connect to the `LibraryManagement` database.
2. Create the following tables:

sql

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```sql
CREATE TABLE Books (

  BookID INT PRIMARY KEY AUTO_INCREMENT,

  Title VARCHAR(100),

  Author VARCHAR(100),

  ISBN VARCHAR(20),

  Genre VARCHAR(50)

);

CREATE TABLE Members (

  MemberID INT PRIMARY KEY AUTO_INCREMENT,

  FirstName VARCHAR(50),

  LastName VARCHAR(50),

  Email VARCHAR(100)
```
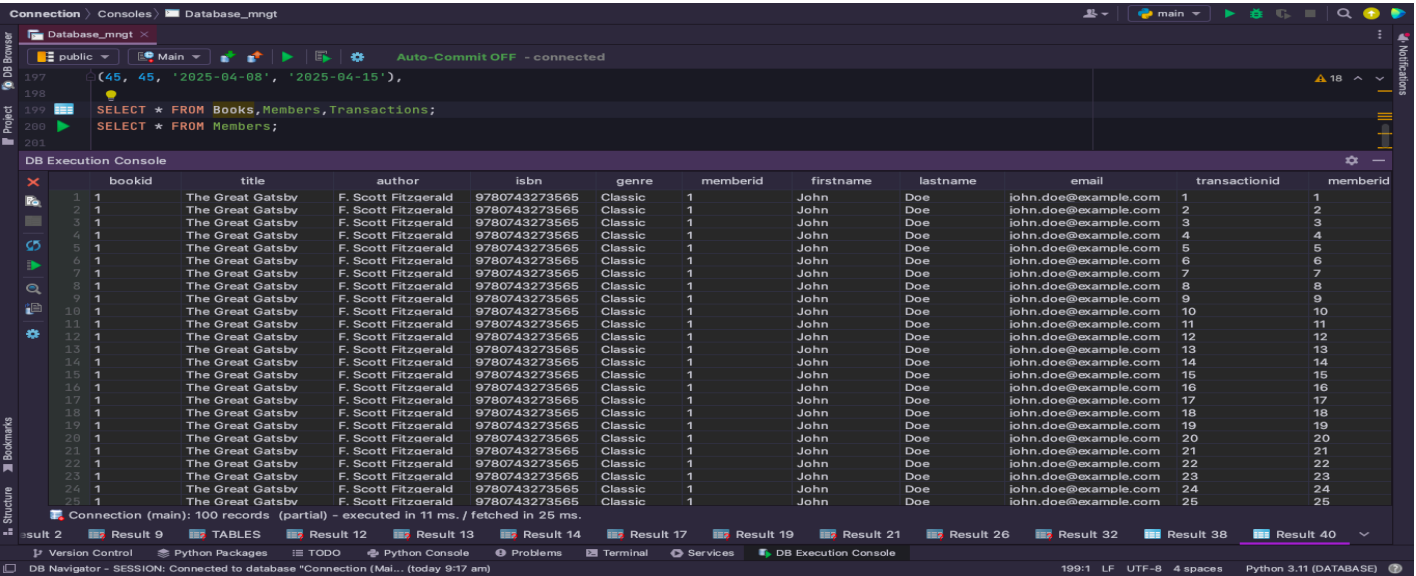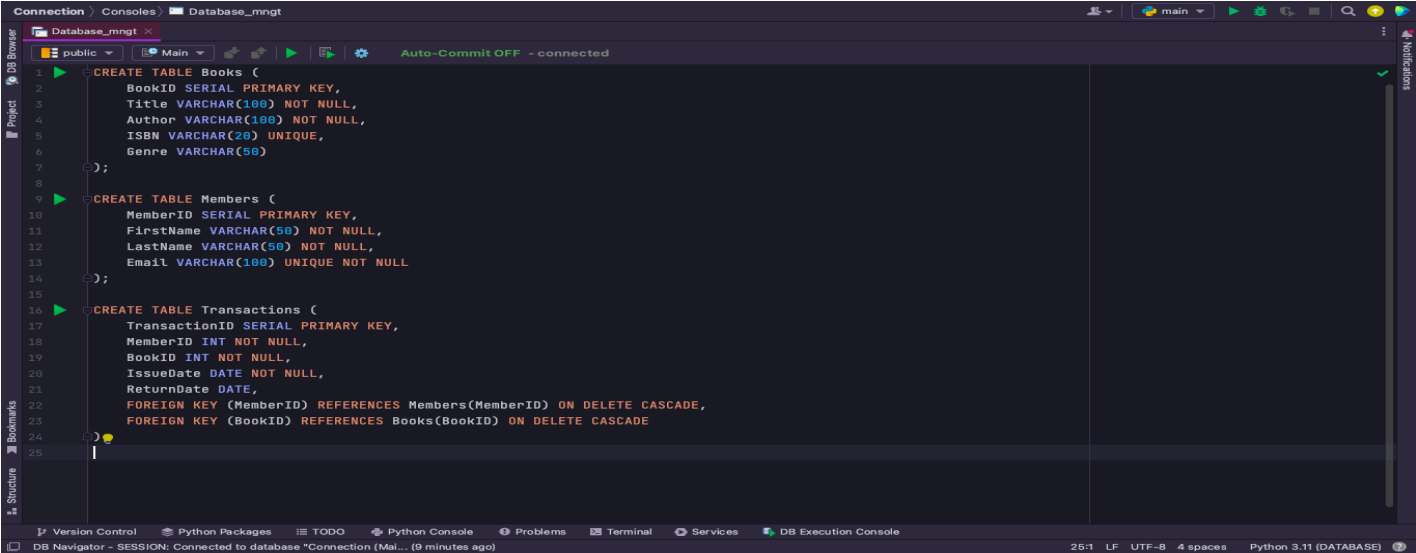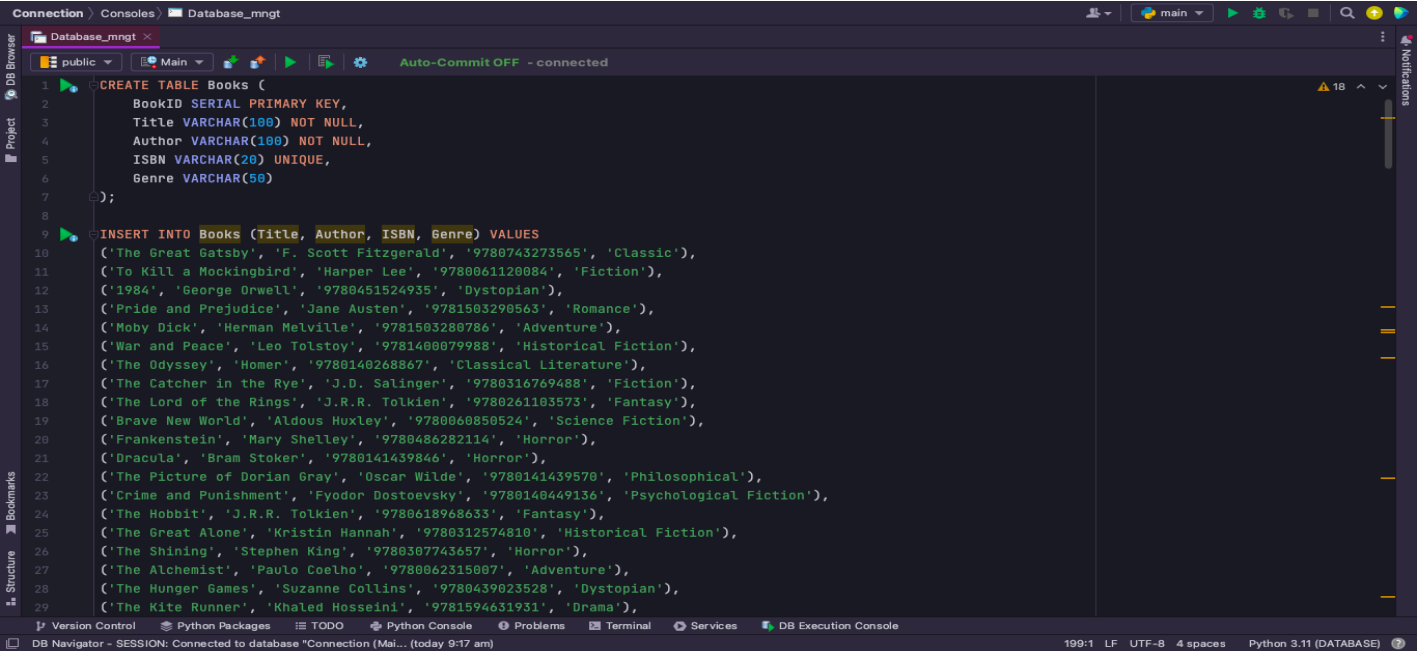
```
);

CREATE TABLE Transactions (

    TransactionID INT PRIMARY KEY AUTO_INCREMENT,

    MemberID INT,

    BookID INT,

    IssueDate DATE,

    ReturnDate DATE,

    FOREIGN KEY (MemberID) REFERENCES Members(MemberID),

    FOREIGN KEY (BookID) REFERENCES Books(BookID)

);
```

1. Verify the tables are created by running `SHOW TABLES;`.

Result:

Three tables (`Books`, `Members`, and `Transactions`) are created.

Additional Questions/Discussions:

- What is the importance of primary keys in a relational database?
  - Primary keys are essential in a relational database because they uniquely identify each record in a table, ensuring data integrity and preventing duplicate entries. They establish relationships between tables through foreign keys, enabling efficient data retrieval and organization. Without primary keys, maintaining consistency and linking related data across tables would be difficult.

- How do foreign keys maintain referential integrity?
  - Foreign keys maintain referential integrity by ensuring that a value in a child table always corresponds to a valid primary key in the parent table. This prevents orphan records, meaning a record in the child table cannot reference a non-existent record in the parent table. Additionally, foreign key constraints help enforce rules such as cascading updates or deletions, keeping data consistent and reliable.

Conclusions:

In conclusion, primary keys and foreign keys are essential for maintaining data integrity in a relational database. Primary keys uniquely identify records, while foreign keys ensure valid relationships between tables and prevent orphan data. Together, they keep the database structured, consistent, and efficient for reliable data management.