Name: Richard Raymond J. Canda Date: 02/07/2025

C.Y.S.: BSCpE – 3A Score:

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:

```
copy code
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),

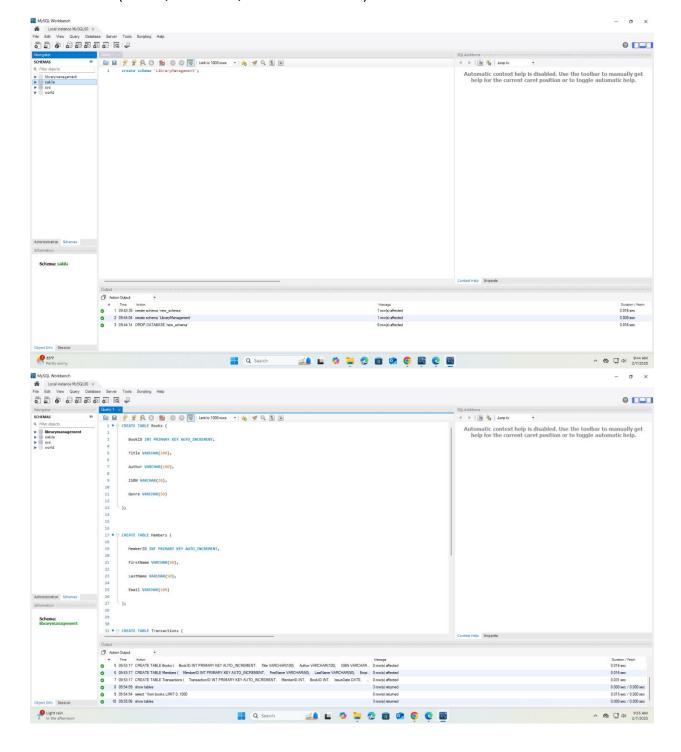
FOREIGN KEY (BookID) REFERENCES Books(BookID)

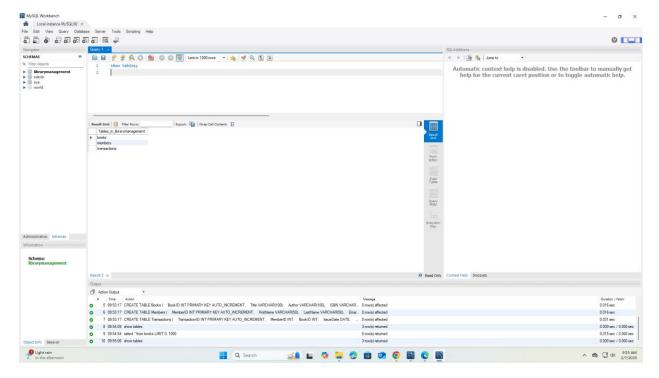
);

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

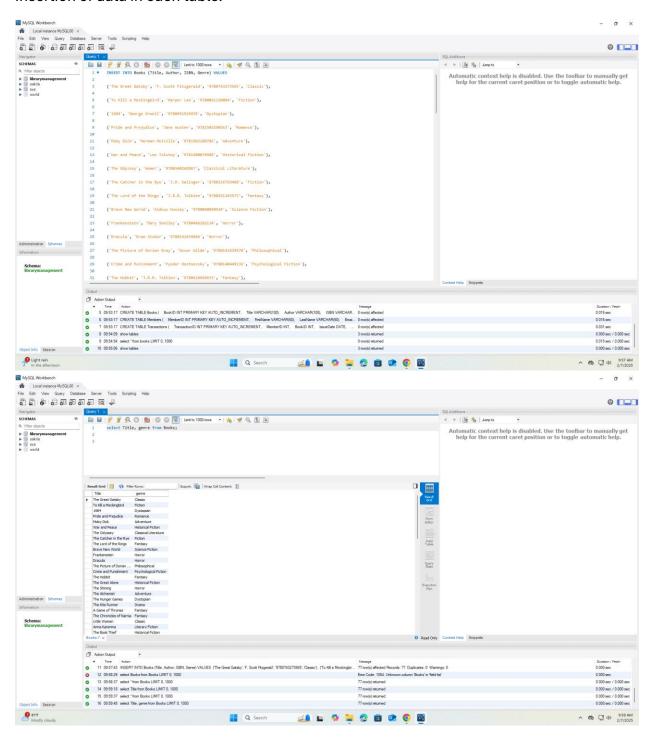
Result:

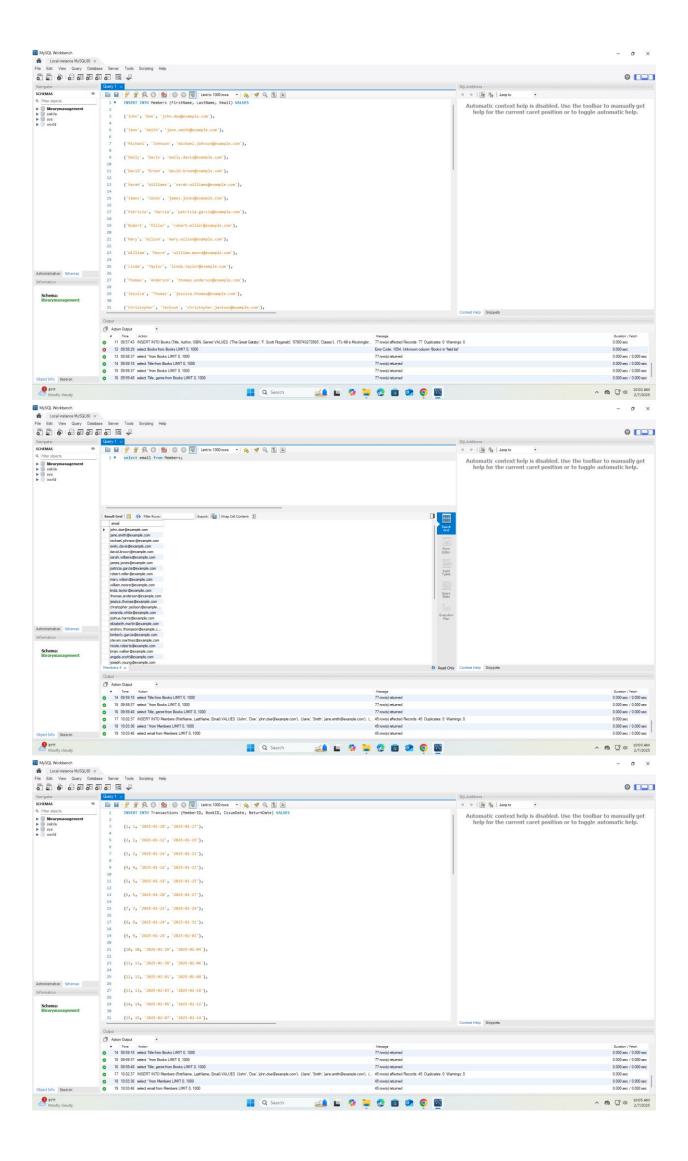
Three tables (Books, Members, and Transactions) are created.

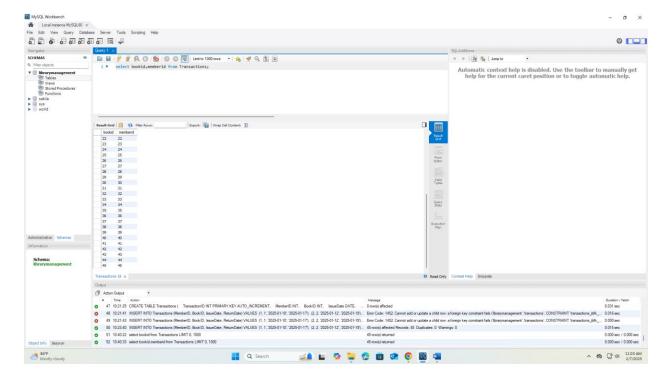




Insertion of data in each table.







Additional Questions/Discussions:

What is the importance of primary keys in a relational database?

Answer:

The primary key is a cornerstone of relational database design. It plays a critical role in maintaining data integrity and ensuring efficient data retrieval. By uniquely identifying each record in a table, the primary key enforces entity integrity, preventing duplicate records and null values.

How do foreign keys maintain referential integrity?

Answer:

A foreign key constraint ensures referential integrity by linking two tables and restricting actions that would break this link.

Conclusions:

In conclusion, primary keys and foreign keys play crucial roles in relational databases. Primary Key act unique identifiers they are essential for maintaining entity integrity by ensuring each record is distinct and easily identifiable. They also enhance query performance through indexing and facilitate relationships between tables. On the other hand, foreign keys are vital for maintaining referential integrity by linking tables and ensuring that relationships between data remain consistent. They prevent orphan records, validate data relationships, and enforce cascade operations for automatic updates and deletions.

Insert DATA

-- Inserting data into Books table

INSERT INTO Books (Title, Author, ISBN, Genre) VALUES

('The Great Gatsby', 'F. Scott Fitzgerald', '9780743273565', 'Classic'),

('To Kill a Mockingbird', 'Harper Lee', '9780061120084', 'Fiction'),

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('1984', 'George Orwell', '9780451524935', 'Dystopian'),
('Pride and Prejudice', 'Jane Austen', '9781503290563', 'Romance'),
('Moby Dick', 'Herman Melville', '9781503280786', 'Adventure'),
('War and Peace', 'Leo Tolstoy', '9781400079988', 'Historical Fiction'),
('The Odyssey', 'Homer', '9780140268867', 'Classical Literature'),
('The Catcher in the Rye', 'J.D. Salinger', '9780316769488', 'Fiction'),
('The Lord of the Rings', 'J.R.R. Tolkien', '9780261103573', 'Fantasy'),
('Brave New World', 'Aldous Huxley', '9780060850524', 'Science Fiction'),
('Frankenstein', 'Mary Shelley', '9780486282114', 'Horror'),
('Dracula', 'Bram Stoker', '9780141439846', 'Horror'),
('The Picture of Dorian Gray', 'Oscar Wilde', '9780141439570', 'Philosophical'),
('Crime and Punishment', 'Fyodor Dostoevsky', '9780140449136', 'Psychological Fiction'),
('The Hobbit', 'J.R.R. Tolkien', '9780618968633', 'Fantasy'),
('The Great Alone', 'Kristin Hannah', '9780312574810', 'Historical Fiction'),
('The Shining', 'Stephen King', '9780307743657', 'Horror'),
('The Alchemist', 'Paulo Coelho', '9780062315007', 'Adventure'),
('The Hunger Games', 'Suzanne Collins', '9780439023528', 'Dystopian'),
('The Kite Runner', 'Khaled Hosseini', '9781594631931', 'Drama'),
('A Game of Thrones', 'George R.R. Martin', '9780553103540', 'Fantasy'),
('The Chronicles of Narnia', 'C.S. Lewis', '9780066238500', 'Fantasy'),
('Little Women', 'Louisa May Alcott', '9780142408760', 'Classic'),
('Anna Karenina', 'Leo Tolstoy', '9780143035008', 'Literary Fiction'),
('The Book Thief', 'Markus Zusak', '9780375842207', 'Historical Fiction'),
('Fahrenheit 451', 'Ray Bradbury', '9781451673319', 'Dystopian'),
('The Road', 'Cormac McCarthy', '9780307387899', 'Post-apocalyptic'),
('A Tale of Two Cities', 'Charles Dickens', '9780141192545', 'Historical Fiction'),
('The Fault in Our Stars', 'John Green', '9780525478812', 'Romance'),
('Gone with the Wind', 'Margaret Mitchell', '9781451635621', 'Historical Romance'),
('Wuthering Heights', 'Emily Brontë', '9780141439556', 'Gothic Fiction'),
('The Outsiders', 'S.E. Hinton', '9780142407336', 'Coming-of-age'),
('The Secret Garden', 'Frances Hodgson Burnett', '9780141321078', 'Children's Literature'),
('The Time Machine', 'H.G. Wells', '9780451530747', 'Science Fiction'),
('The Handmaid's Tale', 'Margaret Atwood', '9780385490818', 'Dystopian'),
('Jane Eyre', 'Charlotte Brontë', '9780141441146', 'Romance'),
('The Secret History', 'Donna Tartt', '9780374522116', 'Psychological Fiction'),
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('Beloved', 'Toni Morrison', '9781400033416', 'Historical Fiction'),
('The Night Circus', 'Erin Morgenstern', '9780385534642', 'Fantasy'),
('The Hunger Games: Catching Fire', 'Suzanne Collins', '9780439026994', 'Dystopian'),
('The Girl on the Train', 'Paula Hawkins', '9781594633669', 'Psychological Thriller'),
('The Help', 'Kathryn Stockett', '9780399155345', 'Historical Fiction'),
('Room', 'Emma Donoghue', '9780316334754', 'Drama'),
('Sharp Objects', 'Gillian Flynn', '9780307341556', 'Thriller'),
('Big Little Lies', 'Liane Moriarty', '9780399167065', 'Drama'),
('The Martian', 'Andy Weir', '9780553418026', 'Science Fiction'),
('The Fault in Our Stars', 'John Green', '9780141345654', 'Romance'),
('All the Light We Cannot See', 'Anthony Doerr', '9781501173219', 'Historical Fiction'),
('The Nightingale', 'Kristin Hannah', '9780312577224', 'Historical Fiction'),
('The Giver', 'Lois Lowry', '9780544336261', 'Dystopian'),
('The Hunger Games', 'Suzanne Collins', '9780439023528', 'Dystopian'),
('Life After Life', 'Kate Atkinson', '9780316176491', 'Historical Fiction'),
('The Rosie Project', 'Graeme Simsion', '9781476729091', 'Romantic Comedy'),
('The Night Watchman', 'Louise Erdrich', '9780062671190', 'Historical Fiction'),
('Circe', 'Madeline Miller', '9780316556347', 'Fantasy'),
('The Silent Patient', 'Alex Michaelides', '9781250301697', 'Psychological Thriller'),
('Where the Crawdads Sing', 'Delia Owens', '9780735219090', 'Mystery'),
('Eleanor Oliphant Is Completely Fine', 'Gail Honeyman', '9780735220683', 'Contemporary
Fiction'),
('Educated', 'Tara Westover', '9780399590504', 'Memoir'),
('Becoming', 'Michelle Obama', '9781524763138', 'Memoir'),
('Normal People', 'Sally Rooney', '9781984822178', 'Literary Fiction'),
('The Seven Husbands of Evelyn Hugo', 'Taylor Jenkins Reid', '9781501161933', 'Historical
Fiction'),
('The Midnight Library', 'Matt Haig', '9780525559474', 'Fantasy'),
('The Tattooist of Auschwitz', 'Heather Morris', '9780062797152', 'Historical Fiction'),
('The Couple Next Door', 'Shari Lapena', '9780735234949', 'Thriller'),
('The Institute', 'Stephen King', '9781982102504', 'Horror'),
('The Silent Corner', 'Dean Koontz', '9780525482793', 'Thriller'),
('The Invisible Man', 'H.G. Wells', '9780451530969', 'Science Fiction'),
('Before We Were Strangers', 'Renée Carlino', '9781501135101', 'Romance'),
('Behind Closed Doors', 'B.A. Paris', '9781250130921', 'Thriller'),
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('Big Little Lies', 'Liane Moriarty', '9780399167065', 'Drama'),
('The Tattooist of Auschwitz', 'Heather Morris', '9780062797152', 'Historical Fiction'),
('The Light We Lost', 'Jill Santopolo', '9780735212763', 'Romance'),
('The Light Between Oceans', 'M.L. Stedman', '9781451681754', 'Historical Fiction'),
('Anxious People', 'Fredrik Backman', '9781501160783', 'Contemporary Fiction'),
('Little Fires Everywhere', 'Celeste Ng', '9780735224315', 'Drama'),
('The Goldfinch', 'Donna Tartt', '9780316055437', 'Literary Fiction');
-- Inserting data into Members table
INSERT INTO Members (FirstName, LastName, Email) VALUES
('John', 'Doe', 'john.doe@example.com'),
('Jane', 'Smith', 'jane.smith@example.com'),
('Michael', 'Johnson', 'michael.johnson@example.com'),
('Emily', 'Davis', 'emily.davis@example.com'),
('David', 'Brown', 'david.brown@example.com'),
('Sarah', 'Williams', 'sarah.williams@example.com'),
('James', 'Jones', 'james.jones@example.com'),
('Patricia', 'Garcia', 'patricia.garcia@example.com'),
('Robert', 'Miller', 'robert.miller@example.com'),
('Mary', 'Wilson', 'mary.wilson@example.com'),
('William', 'Moore', 'william.moore@example.com'),
('Linda', 'Taylor', 'linda.taylor@example.com'),
('Thomas', 'Anderson', 'thomas.anderson@example.com'),
('Jessica', 'Thomas', 'jessica.thomas@example.com'),
('Christopher', 'Jackson', 'christopher.jackson@example.com'),
('Amanda', 'White', 'amanda.white@example.com'),
('Joshua', 'Harris', 'joshua.harris@example.com'),
('Elizabeth', 'Martin', 'elizabeth.martin@example.com'),
('Andrew', 'Thompson', 'andrew.thompson@example.com'),
('Kimberly', 'Garcia', 'kimberly.garcia@example.com'),
('Steven', 'Martinez', 'steven.martinez@example.com'),
('Nicole', 'Roberts', 'nicole.roberts@example.com'),
('Brian', 'Walker', 'brian.walker@example.com'),
('Angela', 'Scott', 'angela.scott@example.com'),
('Joseph', 'Young', 'joseph.young@example.com'),
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('Samantha', 'Allen', 'samantha.allen@example.com'),
('Benjamin', 'King', 'benjamin.king@example.com'),
('Rachel', 'Green', '\underline{rachel.green@example.com}'),
('Daniel', 'Adams', 'daniel.adams@example.com'),
('Lauren', 'Baker', 'lauren.baker@example.com'),
('Ethan', 'Nelson', 'ethan.nelson@example.com'),
('Hannah', 'Carter', 'hannah.carter@example.com'),
('Jack', 'Mitchell', 'jack.mitchell@example.com'),
('Megan', 'Perez', '\underline{megan.perez@example.com}'),
('Ryan', 'Roberts', 'ryan.roberts@example.com'),
('Ashley', 'Morris', 'ashley.morris@example.com'),
('William', 'Evans', 'william.evans@example.com'),
('Olivia', 'Collins', 'olivia.collins@example.com'),
('Matthew', 'Stewart', 'matthew.stewart@example.com'),
('Sophia', 'Sanchez', 'sophia.sanchez@example.com'),
('Lucas', 'Rogers', 'lucas.rogers@example.com'),
('Ava', 'Reed', 'ava.reed@example.com'),
('Gabriel', 'Cook', 'gabriel.cook@example.com'),
('Charlotte', 'Morgan', 'charlotte.morgan@example.com'),
('Jack', 'Bennett', 'jack.bennett@example.com');
-- Inserting data into Transactions table
INSERT INTO Transactions (MemberID, BookID, IssueDate, ReturnDate) VALUES
(1, 1, '2025-01-10', '2025-01-17'),
(2, 2, '2025-01-12', '2025-01-19'),
(3, 3, '2025-01-14', '2025-01-21'),
(4, 4, '2025-01-16', '2025-01-23'),
(5, 5, '2025-01-18', '2025-01-25'),
(6, 6, '2025-01-20', '2025-01-27'),
(7, 7, '2025-01-22', '2025-01-29'),
(8, 8, '2025-01-24', '2025-01-31'),
(9, 9, '2025-01-26', '2025-02-02'),
(10, 10, '2025-01-28', '2025-02-04'),
(11, 11, '2025-01-30', '2025-02-06'),
(12, 12, '2025-02-01', '2025-02-08'),
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(13, 13, '2025-02-03', '2025-02-10'),
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(48, 48, '2025-04-14', '2025-04-21'),

(49, 49, '2025-04-16', '2025-04-23'),

(50, 50, '2025-04-18', '2025-04-25');