

Laboratory Activity 2: Creating Tables and Establishing Primary Keys

```
CREATE TABLE Books (  
    BookID INT PRIMARY KEY AUTO_INCREMENT,  
    Title VARCHAR(100),  
    Author VARCHAR(100),  
    ISBN VARCHAR(20),  
    Genre VARCHAR(50)  
);
```

4	10:47:23	use LibraryManagement	
5	10:49:03	CREATE TABLE Books (BookID INT PRIMARY KEY AUTO_INCREMENT, Titl...	

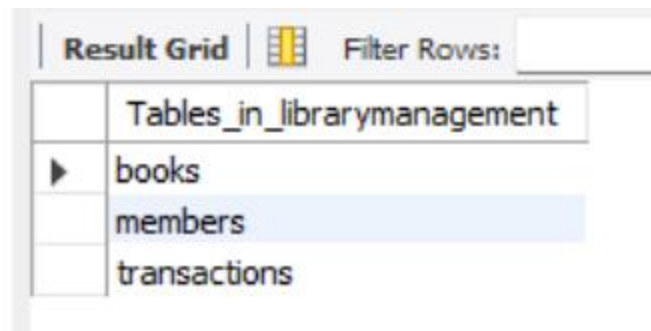
```
CREATE TABLE Members (  
    MemberID INT PRIMARY KEY AUTO_INCREMENT,  
    FirstName VARCHAR(50),  
    LastName VARCHAR(50),  
    Email VARCHAR(100)  
);
```

4	10:47:23	use LibraryManagement	0 row(s) affected
5	10:49:03	CREATE TABLE Books (BookID INT PRIMARY KEY AUTO_INCREMENT, Titl...	0 row(s) affected
6	10:49:37	CREATE TABLE Members (MemberID INT PRIMARY KEY AUTO_INCREMENT, ...	0 row(s) affected

```
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)  
);
```

5	10:49:03	CREATE TABLE BOOKS (BOOKID INT PRIMARY KEY AUTO_INCREMENT, ...	0 row(s) affected
6	10:49:37	CREATE TABLE Members (MemberID INT PRIMARY KEY AUTO_INCREMEN...	0 row(s) affected
7	10:49:58	CREATE TABLE Transactions (TransactionID INT PRIMARY KEY AUTO_INCR...	0 row(s) affected

show tables;



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

Primary keys uniquely identify each record in a table, ensuring data integrity and preventing duplicate entries, which is essential for maintaining accurate and reliable data in a relational database.

How do foreign keys maintain referential integrity?

Foreign keys maintain referential integrity by ensuring that relationships between tables are consistent and valid, preventing actions that would create inconsistent or orphaned data, such as deleting a parent record without deleting its child records.

Conclusion: I successfully created three tables (Books, Members, and Transactions) for the library management system, learning to define primary keys, establish relationships using foreign keys, and laying the groundwork for future database development.

```
INSERT INTO Books (Title, Author, ISBN, Genre) VALUES
('The Great Gatsby', 'F. Scott Fitzgerald', '9780743273565', 'Classic'),
('To Kill a Mockingbird', 'Harper Lee', '9780061120084', 'Fiction'),
('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'),
('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'),
('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');

7	10:49:58	CREATE TABLE Transactions (TransactionID INT PRIMARY KEY AUTO_INCR...	0 row(s) affected
8	10:50:20	show tables	3 row(s) returned
9	10:51:01	INSERT INTO Books (Title, Author, ISBN, Genre) VALUES ('The Great Gatsby', 'F. ...	77 row(s) affected Records: 77 Duplicates: (

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'),
('Samantha', 'Allen', 'samantha.allen@example.com'),
('Benjamin', 'King', 'benjamin.king@example.com'),
('Rachel', 'Green', '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', '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');

8	10:50:20	show tables	3 row(s) returned
9	10:51:01	INSERT INTO Books (Title, Author, ISBN, Genre) VALUES ('The Great Gatsby', 'F. ...	77 row(s) affected Records: 77 Duplicates: 0 Warnings:
10	10:52:01	INSERT INTO Members (FirstName, LastName, Email) VALUES ('John', 'Doe', 'john...	45 row(s) affected Records: 45 Duplicates: 0 Warnings:

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'),
(13, 13, '2025-02-03', '2025-02-10'),

(14, 14, '2025-02-05', '2025-02-12'),
(15, 15, '2025-02-07', '2025-02-14'),
(16, 16, '2025-02-09', '2025-02-16'),
(17, 17, '2025-02-11', '2025-02-18'),
(18, 18, '2025-02-13', '2025-02-20'),
(19, 19, '2025-02-15', '2025-02-22'),
(20, 20, '2025-02-17', '2025-02-24'),
(21, 21, '2025-02-19', '2025-02-26'),
(22, 22, '2025-02-21', '2025-02-28'),
(23, 23, '2025-02-23', '2025-03-02'),
(24, 24, '2025-02-25', '2025-03-04'),
(25, 25, '2025-02-27', '2025-03-06'),
(26, 26, '2025-03-01', '2025-03-08'),
(27, 27, '2025-03-03', '2025-03-10'),
(28, 28, '2025-03-05', '2025-03-12'),
(29, 29, '2025-03-07', '2025-03-14'),
(30, 30, '2025-03-09', '2025-03-16'),
(31, 31, '2025-03-11', '2025-03-18'),
(32, 32, '2025-03-13', '2025-03-20'),
(33, 33, '2025-03-15', '2025-03-22'),
(34, 34, '2025-03-17', '2025-03-24'),
(35, 35, '2025-03-19', '2025-03-26'),
(36, 36, '2025-03-21', '2025-03-28'),
(37, 37, '2025-03-23', '2025-03-30'),
(38, 38, '2025-03-25', '2025-04-01'),
(39, 39, '2025-03-27', '2025-04-03'),
(40, 40, '2025-03-29', '2025-04-05'),
(41, 41, '2025-03-31', '2025-04-07'),
(42, 42, '2025-04-02', '2025-04-09'),
(43, 43, '2025-04-04', '2025-04-11'),
(44, 44, '2025-04-06', '2025-04-13'),
(45, 45, '2025-04-08', '2025-04-15');

✓	9	10:51:01	INSERT INTO Books (Title, Author, ISBN, Genre) VALUES ('The Great Gatsby', 'F. ...	77 row(s) affected Records: 77 Duplicates: 0 Warnings: 0
✓	10	10:52:01	INSERT INTO Members (FirstName, LastName, Email) VALUES ('John', 'Doe', 'john...	45 row(s) affected Records: 45 Duplicates: 0 Warnings: 0
✓	11	10:53:00	INSERT INTO Transactions (MemberID, BookID, IssueDate, ReturnDate) VALUES...	45 row(s) affected Records: 45 Duplicates: 0 Warnings: 0