Project #2 Part 2 - CSE 3330-004 - Library Management System Database
Dev Patel

Task 1: Tables for LMS database:

- **PUBLISHER**:Name, Phone, Address

```sql
CREATE TABLE Publisher (
    Name VARCHAR(100) PRIMARY KEY,
    Phone CHAR(12),
    Address VARCHAR(255)
);
```

- **LIBRARY_BRANCH**: Branch_ID, Branch_Name, Branch_Address

```sql
CREATE TABLE LIBRARY_BRANCH (
    Branch_ID INT PRIMARY KEY,
    Branch_Name VARCHAR(200),
    Branch_Address VARCHAR(200)
);
```

- **BORROWER**: Card_No, Name, Address, Phone

```sql
CREATE TABLE BORROWER (
    Card_No INT PRIMARY KEY,
    Name VARCHAR(200),
    Address VARCHAR(200),
    Phone CHAR(12)
);
```

- **BOOK**: Book_ID, Title, Publisher

```sql
CREATE TABLE Book (
    Book_ID INT PRIMARY KEY,
    Title VARCHAR(200),
    Publisher VARCHAR(200),
    FOREIGN KEY (Publisher) REFERENCES PUBLISHER(Name)
);
```

- **BOOK_LOANS**: Book_Id, Branch_Id, Card_No, Date_Out, Due_Date, Returned_date

```
CREATE TABLE Book_Loans (
    Book_ID INT,
    Branch_ID INT,
Card_No INT,
    Date_Out DATE,
    Due_Date DATE,
    Returned_Date DATE,
    PRIMARY KEY (Book_ID, Branch_ID, Card_No),
    FOREIGN KEY (Book_ID) REFERENCES BOOK(Book_ID),
    FOREIGN KEY (Branch_ID) REFERENCES LIBRARY_BRANCH(Branch_ID),
FOREIGN KEY (Card_No) REFERENCES Borrower(Card_No)
);
```

- **BOOK_COPIES**: Book_Id, Branch_Id, No_Of_Copies

```
CREATE TABLE BOOK_COPIES (
    Book_ID INT,
    Branch_ID INT,
    No_Of_Copies INT,
    PRIMARY KEY (Book_ID, Branch_ID),
    FOREIGN KEY (Book_ID) REFERENCES BOOK(Book_ID),
    FOREIGN KEY (Branch_ID) REFERENCES LIBRARY_BRANCH(Branch_ID)
);
```

- **BOOK_AUTHORS**: Book_Id, Author_Name

```
CREATE TABLE AUTHOR (
    Book_ID INT,
    Author_Name VARCHAR(200),
    PRIMARY KEY (Book_ID, Author_Name),
    FOREIGN KEY (Book_ID) REFERENCES BOOK(Book_ID)
);
```

Task 2: Load the data from the text files into the corresponding tables:

- We pasted all of the data into the terminal in VSCode by using the command
  INSERT INTO TABLE (data of attributes) VALUES
  (data of all attributes here on)

- **PUBLISHER**: Name, Phone, Address

```sql
INSERT INTO PUBLISHER (Name, Phone, Address) VALUES
('HarperCollins', '212-207-7000', '195 Broadway, New York, NY 10007'),
('Penguin Books', '212-366-3000', '475 Hudson St, New York, NY 10014'),
('Penguin Classics', '212-366-2000', '123 Main St, California, CA 01383'),
('Scribner', '212-207-7474', '19 Broadway, New York, NY 10007'),
('Harper & Row', '212-207-7000', '1195 Border street, Montana, MT 59007'),
('Little, Brown and Company', '212-764-2000', '111 Huddle St, New Jersey, NJ 32014'),
('Faber and Faber', '201-797-3800', '463 south centre street, Arizona, AR 71653'),
('Chatto & Windus', '442-727-3800', 'Bloomsbury House, 7477 Great Russell St, Arizona, AR 72965'),
('Ward, Lock and Co.', '647-242-3434', '456 Maple Ave, Texas, TX 76013'),
('Random House India', '291-225-6634', '423 baywatch centre street, Alabama, AL 30513'),
('Thomas Cautley Newby', '243-353-2352', '890 Elmwood Dr, Floride, FL 98238'),
('Allen & Unwin', '212-782-9001', '22 New Wharf Rd, Arizona, AR 70654'),
('Pan Books', '313-243-5353', '567 Pine Tree Rd, Colorado, CO 87348'),
('Bantam Books', '313-243-5354', '1745 Broadway, New York, NY 10019'),
('Doubleday', '212-782-9000', '789 Division St, Minnesota, MN 55344'),
('American Publishing Company', '682-243-3524', '7652 Northgate way lane, Georgia, GA 30054'),
('Chapman and Hall', '833-342-2343', '789 Oak St, Texas, TX 76010');
```

- **LIBRARY_BRANCH**: Branch_ID, Branch_Name, Branch_Address

```sql
INSERT INTO LIBRARY_BRANCH (Branch_ID, Branch_Name, Branch_Address) VALUES
(1, 'Main Branch', '123 Main St, New York, NY 10003'),
(2, 'West Branch', '456 West St, Arizona, AR 70622'),
(3, 'East Branch', '789 East St, New Jersey, NJ 32032');
```

- **BORROWER**: Card_No, Name, Address, Phone

```sql
INSERT INTO BORROWER (Card_No, Name, Address, Phone) VALUES
(123456, 'John Smith', '456 Oak St, Arizona, AR 70010', '205-555-5555'),
(789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
(345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
(901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
(567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
(234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
```

```
(890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
(456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
(111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
(222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
(333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
(444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
(555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
(565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
(676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
(787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
(989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
(121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
(232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
(343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
(454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
```

- **BOOK**: Book_ID, Title, Publisher

```sql
INSERT INTO BOOK (Book_ID, Title, Publisher) VALUES
(1, 'To Kill a Mockingbird', 'HarperCollins'),
(2, '1984', 'Penguin Books'),
(3, 'Pride and Prejudice', 'Penguin Classics'),
(4, 'The Great Gatsby', 'Scribner'),
(5, 'One Hundred Years of Solitude', 'Harper & Row'),
(6, 'Animal Farm', 'Penguin Books'),
(7, 'The Catcher in the Rye', 'Little, Brown and Company'),
(8, 'Lord of the Flies', 'Faber and Faber'),
(9, 'Brave New World', 'Chatto & Windus'),
(10, 'The Picture of Dorian Gray', 'Ward, Lock and Co.'),
(11, 'The Alchemist', 'HarperCollins'),
(12, 'The God of Small Things', 'Random House India'),
(13, 'Wuthering Heights', 'Thomas Cautley Newby'),
(14, 'The Hobbit', 'Allen & Unwin'),
(15, 'The Lord of the Rings', 'Allen & Unwin'),
(16, 'The Hitchhiker's Guide to the Galaxy', 'Pan Books'),
(17, 'The Diary of a Young Girl', 'Bantam Books'),
(18, 'The Da Vinci Code', 'Doubleday'),
(19, 'The Adventures of Huckleberry Finn', 'Penguin Classics'),
(20, 'The Adventures of Tom Sawyer', 'American Publishing Company'),
(21, 'A Tale of Two Cities', 'Chapman and Hall');
```

- **BOOK_LOANS**: Book_Id, Branch_Id, Card_No, Date_Out, Due_Date, Returned_date

```sql
INSERT INTO BOOK_LOANS (Book_ID, Branch_ID, Card_No, Date_Out, Due_Date, INSERT INTO
BOOK_LOANS (Book_ID, Branch_ID, Card_No, Date_Out, Due_Date, Returned_Date) VALUES
(1, 1, 123456, '2022-01-01', '2022-02-01', '2022-02-01'),
(2, 1, 789012, '2022-01-02', '2022-02-02', NULL),
(3, 2, 345678, '2022-01-03', '2022-02-03', NULL),
(4, 3, 901234, '2022-01-04', '2022-02-04', '2022-02-04'),
(5, 1, 567890, '2022-01-05', '2022-02-05', '2022-02-09'),
(6, 2, 234567, '2022-01-06', '2022-02-06', '2022-02-10'),
(7, 2, 890123, '2022-01-07', '2022-02-07', '2022-03-08'),
(8, 3, 456789, '2022-01-08', '2022-02-08', '2022-03-10'),
(9, 1, 111111, '2022-01-09', '2022-02-09', '2022-02-06'),
(10, 2, 222222, '2022-01-10', '2022-02-10', '2022-02-07'),
(11, 1, 333333, '2022-03-01', '2022-03-08', '2022-03-08'),
(12, 3, 444444, '2022-03-03', '2022-03-10', '2022-03-10'),
(13, 3, 555555, '2022-02-03', '2022-03-03', '2022-02-18'),
(14, 1, 565656, '2022-01-14', '2022-02-14', '2022-03-31'),
(15, 3, 676767, '2022-01-15', '2022-02-15', '2022-02-21'),
(16, 2, 787878, '2022-03-05', '2022-03-12', '2022-03-24'),
(17, 3, 989898, '2022-03-23', '2022-03-30', '2022-03-30'),
(18, 3, 121212, '2022-01-18', '2022-02-18', '2022-02-18'),
(19, 1, 232323, '2022-03-24', '2022-03-31', '2022-03-31'),
(20, 3, 343434, '2022-01-21', '2022-03-21', '2022-02-21'),
(21, 3, 454545, '2022-01-24', '2022-02-24', '2022-02-24');
```

- **BOOK_COPIES**: Book_Id, Branch_Id, No_Of_Copies

```sql
INSERT INTO BOOK_COPIES (Book_ID, Branch_ID, No_Of_Copies) VALUES
(1, 1, 3),
(2, 1, 2),
(3, 2, 1),
(4, 3, 4),
(5, 1, 5),
(6, 2, 3),
(7, 2, 2),
(8, 3, 1),
(9, 1, 4),
(10, 2, 2),
(11, 1, 3),
(12, 3, 2),
(13, 3, 1),
(14, 1, 5),
(15, 3, 1),
(16, 2, 3),
(17, 3, 2),
(18, 3, 2),
(19, 1, 5),
(20, 3, 1),
(21, 3, 1);
```

- **BOOK_AUTHORS**: Book_Id, Author_Name

```
INSERT INTO AUTHOR (Book_ID, Author_Name) VALUES
(1, 'Harper Lee'),
(2, 'George Orwell'),
(3, 'Jane Austen'),
(4, 'F. Scott Fitzgerald'),
(5, 'Gabriel Garcia Marquez'),
(6, 'George Orwell'),
(7, 'J.D. Salinger'),
(8, 'William Golding'),
(9, 'Aldous Huxley'),
(10, 'Oscar Wilde'),
(11, 'Paulo Coelho'),
(12, 'Arundhati Roy'),
(13, 'Emily Bronte'),
(14, 'J.R.R. Tolkien'),
(15, 'J.R.R. Tolkien'),
(16, 'Douglas Adams'),
(17, 'Anne Frank'),
(18, 'Dan Brown'),
(19, 'Mark Twain'),
(20, 'Mark Twain'),
(21, 'Charles Dickens');
```

Task 3: Then execute the following queries on the database tables:

- **Question 1**: Insert yourself as a New Borrower. Do not provide the Card_no in your query. [2 points]

```
INSERT INTO BORROWER (Name, Address, Phone) VALUES ('Dev Patel',
'123 LeBron Street, Arlington, TX 76019', '817-272-2011');
```

```
1 record affected as we added a new borrower in the Borrower table.
    Since we inserted 1 record, which is the borrower Dev
  Patel and his street, address, and phone number
```

```
29  (789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
30  (345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
31  (901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
32  (567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
33  (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
34  (890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
35  (456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
36  (111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
37  (222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
38  (333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
39  (444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
40  (555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
41  (565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
42  (676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
43  (787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
44  (989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
45  (121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
46  (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
47  (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
48  (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
```

```
sqlite> INSERT INTO BORROWER (Name, Address, Phone) VALUES ('Dev Patel', '123 LeBron Street, Arlington, TX 76019', '817-272-2011');
sqlite> SELECT * FROM BORROWER;
123456|John Smith|456 Oak St, Arizona, AR 70010|205-555-5555
789012|Jane Doe|789 Maple Ave, New Jersey, NJ 32542|555-235-5556
345678|Bob Johnson|12 Elm St, Arizona, AR 70345|545-243-5557
901234|Sarah Kim|345 Pine St, New York, NY 10065|515-325-2158
567890|Tom Lee|678 S Oak St, New York, NY 10045|209-525-5559
234567|Emily Lee|389 Oaklay St, Arizona, AR 70986|231-678-5560
890123|Michael Park|123 Pinewood St, New Jersey, NJ 32954|655-890-2161
456789|Laura Chen|345 Mapman Ave, Arizona, AR 70776|565-985-9962
111111|Alex Kim|983 Sine St, Arizona, AR 70451|678-784-5563
222222|Rachel Lee|999 Apple Ave, Arizona, AR 70671|231-875-5564
333333|William Johnson|705 Paster St, New Jersey, NJ 32002|235-525-5567
444444|Ethan Martinez|466 Deeplm St, New York, NY 10321|555-555-5569
555555|Grace Hernandez|315 Babes St, Arizona, AR 70862|455-567-5587
565656|Sophia Park|678 Dolphin St, New York, NY 10062|675-455-5568
676767|Olivia Lee|345 Spine St, New York, NY 10092|435-878-5569
787878|Noah Thompson|189 GreenOak Ave, New Jersey, NJ 32453|245-555-5571
989898|Olivia Smith|178 Elm St, New Jersey, NJ 32124|325-500-5579
121212|Dylan Kim|345 Shark St, Arizona, AR 72213|755-905-5572
232323|William Chen|890 Sting St, New York, NY 10459|406-755-5580
343434|Olivia Johnson|345 Pine St, New Jersey, NJ 32095|662-554-5575
454545|Dylan Kim|567 Cowboy way St, New Jersey, NJ 32984|435-254-5578
|Dev Patel|123 LeBron Street, Arlington, TX 76019|817-272-2011
sqlite> UPDATE BORROWER
```

Question 2: Update your phone number to (837) 721-8965   [2 points]

```
UPDATE BORROWER
SET Phone = '(837) 721-8965'
WHERE Name = 'Dev Patel';
```

1 record affected as we updated the borrower's, Dev Patel's, phone number in the BORROWER table.

```
29  (789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
30  (345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
31  (901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
32  (567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
33  (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
34  (890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
35  (456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
36  (111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
37  (222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
38  (333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
39  (444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
40  (555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
41  (565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
42  (676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
43  (787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
44  (989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
45  (121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
46  (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
47  (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
48  (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
```

```
sqlite> SELECT * FROM BORROWER;
123456|John Smith|456 Oak St, Arizona, AR 70010|205-555-5555
789012|Jane Doe|789 Maple Ave, New Jersey, NJ 32542|555-235-5556
345678|Bob Johnson|12 Elm St, Arizona, AR 70345|545-243-5557
901234|Sarah Kim|345 Pine St, New York, NY 10065|515-325-2158
567890|Tom Lee|678 S Oak St, New York, NY 10045|209-525-5559
234567|Emily Lee|389 Oaklay St, Arizona, AR 70986|231-678-5560
890123|Michael Park|123 Pinewood St, New Jersey, NJ 32954|655-890-2161
456789|Laura Chen|345 Mapman Ave, Arizona, AR 70776|565-985-9962
111111|Alex Kim|983 Sine St, Arizona, AR 70451|678-784-5563
222222|Rachel Lee|999 Apple Ave, Arizona, AR 70671|231-875-5564
333333|William Johnson|705 Paster St, New Jersey, NJ 32002|235-525-5567
444444|Ethan Martinez|466 Deeplm St, New York, NY 10321|555-555-5569
555555|Grace Hernandez|315 Babes St, Arizona, AR 70862|455-567-5587
565656|Sophia Park|678 Dolphin St, New York, NY 10062|675-455-5568
676767|Olivia Lee|345 Spine St, New York, NY 10092|435-878-5569
787878|Noah Thompson|189 GreenOak Ave, New Jersey, NJ 32453|245-555-5571
989898|Olivia Smith|178 Elm St, New Jersey, NJ 32124|325-500-5579
121212|Dylan Kim|345 Shark St, Arizona, AR 72213|755-905-5572
232323|William Chen|890 Sting St, New York, NY 10459|406-755-5580
343434|Olivia Johnson|345 Pine St, New Jersey, NJ 32095|662-554-5575
454545|Dylan Kim|567 Cowboy way St, New Jersey, NJ 32984|435-254-5578
|Dev Patel|123 LeBron Street, Arlington, TX 76019|(837) 721-8965
```

● **Question 3**: Increase the number of book_copies by 1 for the 'East Branch' [2 points]

```
UPDATE BOOK_COPIES
SET No_Of_Copies = No_Of_Copies + 1
WHERE Branch_ID = (SELECT Branch_ID FROM LIBRARY_BRANCH WHERE
Branch_Name = 'East Branch');
```

9 records affected as each record that had a branch_id of 3, which resembles the East Branch, had the number of copies increased by 1.

```
99   INSERT INTO BOOK_COPIES (Book_ID, Branch_ID, No_Of_Copies) VALUES
100  (1, 1, 3),
101  (2, 1, 2),
102  (3, 2, 1),
103  (4, 3, 4),
104  (5, 1, 5),
105  (6, 2, 3),
106  (7, 2, 2),
107  (8, 3, 1),
108  (9, 1, 4),
109  (10, 2, 2),
110  (11, 1, 3),
111  (12, 3, 2),
112  (13, 3, 1),
113  (14, 1, 5),
114  (15, 3, 1),
115  (16, 2, 3),
116  (17, 3, 2),
117  (18, 3, 2),
118  (19, 1, 5),
```

```
sqlite> UPDATE BOOK_COPIES
   ...> SET No_Of_Copies = No_Of_Copies + 1
   ...> WHERE Branch_ID = (SELECT Branch_ID FROM LIBRARY_BRANCH WHERE Branch_Name = 'East Branch');
sqlite> SELECT * FROM BOOK_COPIES;
1|1|3
2|1|2
3|2|1
4|3|5
5|1|5
6|2|3
7|2|2
8|3|2
9|1|4
10|2|2
11|1|3
12|3|3
13|3|2
14|1|5
15|3|2
16|2|3
17|3|3
18|3|3
19|1|5
20|3|2
21|3|2
sqlite> []
```

———

- **Question 4-a:** Insert a new BOOK with the following info: Title: ' Harry Potter and the Sorcerer's Stone'; Book_author: 'J.K. Rowling' ; Publisher_name: 'Oxford Publisheing' [2 points]

  We assumed the next book's (Harry Potter) book ID would be 22, since the last book's Book ID was 21. We used Book ID to connect JK Rowling authoring the Harry Potter Book since in BOOK, there is no author attribute, we went ahead and added the Book ID (22) to the AUTHOR table to connect JK Rowling authored Harry Potter.

INSERT INTO BOOK (Book_ID, Title, Publisher)
VALUES (22, 'Harry Potter and the Sorcerer's Stone', 'Oxford Publishing');

INSERT INTO AUTHOR (Book_ID, Author_Name)
VALUES (22, 'J.K. Rowling');
2 records affected, 1 into BOOK table and the other in the AUTHOR table.

```
55    (4, 'The Great Gatsby', 'Scribner'),
56    (5, 'One Hundred Years of Solitude', 'Harper & Row'),
57    (6, 'Animal Farm', 'Penguin Books'),
58    (7, 'The Catcher in the Rye', 'Little, Brown and Company'),
59    (8, 'Lord of the Flies', 'Faber and Faber'),
60    (9, 'Brave New World', 'Chatto & Windus'),
61    (10, 'The Picture of Dorian Gray', 'Ward, Lock and Co.'),
62    (11, 'The Alchemist', 'HarperCollins'),
63    (12, 'The God of Small Things', 'Random House India'),
64    (13, 'Wuthering Heights', 'Thomas Cautley Newby'),
65    (14, 'The Hobbit', 'Allen & Unwin'),
66    (15, 'The Lord of the Rings', 'Allen & Unwin'),
67    (16, 'The Hitchhiker's Guide to the Galaxy', 'Pan Books'),
68    (17, 'The Diary of a Young Girl', 'Bantam Books'),
69    (18, 'The Da Vinci Code', 'Doubleday'),
70    (19, 'The Adventures of Huckleberry Finn', 'Penguin Classics'),
71    (20, 'The Adventures of Tom Sawyer', 'American Publishing Company'),
72    (21, 'A Tale of Two Cities', 'Chapman and Hall');
73
```

```
sqlite> SELECT * FROM BOOK;
1|To Kill a Mockingbird|HarperCollins
2|1984|Penguin Books
3|Pride and Prejudice|Penguin Classics
4|The Great Gatsby|Scribner
5|One Hundred Years of Solitude|Harper & Row
6|Animal Farm|Penguin Books
7|The Catcher in the Rye|Little, Brown and Company
8|Lord of the Flies|Faber and Faber
9|Brave New World|Chatto & Windus
10|The Picture of Dorian Gray|Ward, Lock and Co.
11|The Alchemist|HarperCollins
12|The God of Small Things|Random House India
13|Wuthering Heights|Thomas Cautley Newby
14|The Hobbit|Allen & Unwin
15|The Lord of the Rings|Allen & Unwin
16|The Hitchhiker's Guide to the Galaxy|Pan Books
17|The Diary of a Young Girl|Bantam Books
18|The Da Vinci Code|Doubleday
19|The Adventures of Huckleberry Finn|Penguin Classics
20|The Adventures of Tom Sawyer|American Publishing Company
21|A Tale of Two Cities|Chapman and Hall
22|Harry Potter and the Sorcerer's Stone|Oxford Publishing
```

```
126  (2, 'George Orwell'),
127  (3, 'Jane Austen'),
128  (4, 'F. Scott Fitzgerald'),
129  (5, 'Gabriel Garcia Marquez'),
130  (6, 'George Orwell'),
131  (7, 'J.D. Salinger'),
132  (8, 'William Golding'),
133  (9, 'Aldous Huxley'),
134  (10, 'Oscar Wilde'),
135  (11, 'Paulo Coelho'),
136  (12, 'Arundhati Roy'),
137  (13, 'Emily Bronte'),
138  (14, 'J.R.R. Tolkien'),
139  (15, 'J.R.R. Tolkien'),
140  (16, 'Douglas Adams'),
141  (17, 'Anne Frank'),
142  (18, 'Dan Brown'),
143  (19, 'Mark Twain'),
144  (20, 'Mark Twain'),
145  (21, 'Charles Dickens');
```

```
sqlite> INSERT INTO AUTHOR (Book_ID, Author_Name)
   ...> VALUES (22, 'J.K. Rowling');
sqlite> SELECT * FROM AUTHOR;
1|Harper Lee
2|George Orwell
3|Jane Austen
4|F. Scott Fitzgerald
5|Gabriel Garcia Marquez
6|George Orwell
7|J.D. Salinger
8|William Golding
9|Aldous Huxley
10|Oscar Wilde
11|Paulo Coelho
12|Arundhati Roy
13|Emily Bronte
14|J.R.R. Tolkien
15|J.R.R. Tolkien
16|Douglas Adams
17|Anne Frank
18|Dan Brown
19|Mark Twain
20|Mark Twain
21|Charles Dickens
22|J.K. Rowling
```

● **Question 4-b**: You also need to insert the following branches: [2 point]

North Branch	456 NW, Irving, TX 76100
UTA Branch	123 Cooper St, Arlington TX 76101

INSERT INTO LIBRARY_BRANCH (Branch_Name, Branch_Address)
VALUES
('North Branch', '456 NW, Irving, TX 76100'),
('UTA Branch', '123 Cooper St, Arlington, TX 76101');

2 records were affected as they were added into the LIBRARY_BRANCH

```
1    INSERT INTO PUBLISHER (Name, Phone, Address) VALUES
2    ('HarperCollins', '212-207-7000', '195 Broadway, New York, NY 10007'),
3    ('Penguin Books', '212-366-3000', '475 Hudson St, New York, NY 10014'),
4    ('Penguin Classics', '212-366-2000', '123 Main St, California, CA 01383'),
5    ('Scribner', '212-207-7474', '19 Broadway, New York, NY 10007'),
6    ('Harper & Row', '212-207-7000', '1195 Border street, Montana, MT 59007'),
7    ('Little, Brown and Company', '212-764-2000', '111 Huddle St, New Jersey, NJ 32014'),
8    ('Faber and Faber', '201-797-3800', '463 south centre street, Arizona, AR 71653'),
9    ('Chatto & Windus', '442-727-3800', 'Bloomsbury House, 7477 Great Russell St, Arizona, AR 72965'),
10   ('Ward, Lock and Co.', '647-242-3434', '456 Maple Ave, Texas, TX 76013'),
11   ('Random House India', '291-225-6634', '423 baywatch centre street, Alabama, AL 30513'),
12   ('Thomas Cautley Newby', '243-353-2352', '890 Elmwood Dr, Floride, FL 98238'),
13   ('Allen & Unwin', '212-782-9001', '22 New Wharf Rd, Arizona, AR 70654'),
14   ('Pan Books', '313-243-5353', '567 Pine Tree Rd, Colorado, CO 87348'),
15   ('Bantam Books', '313-243-5354', '1745 Broadway, New York, NY 10019'),
16   ('Doubleday', '212-782-9000', '789 Division St, Minnesota, MN 55344'),
17   ('American Publishing Company', '602-243-3524', '7652 Northgate way lane, Georgia, GA 30054'),
18   ('Chapman and Hall', '833-342-2343', '789 Oak St, Texas, TX 76010');
19
20
21   INSERT INTO LIBRARY_BRANCH (Branch_ID, Branch_Name, Branch_Address) VALUES
22   (1, 'Main Branch', '123 Main St, New York, NY 10003'),
23   (2, 'West Branch', '456 West St, Arizona, AR 70622'),
24   (3, 'East Branch', '789 East St, New Jersey, NJ 32032');
25
26   INSERT INTO BORROWER (Card_No, Name, Address, Phone) VALUES
27   (123456, 'John Smith', '456 Oak St, Arizona, AR 70010', '205-555-5555'),
28   (789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
29   (345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
30   (901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
31   (567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
32   (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
```

```
sqlite> INSERT INTO LIBRARY_BRANCH (Branch_Name, Branch_Address) VALUES
   ...> ('North Branch', '456 NW, Irving, TX 76100'),
   ...> ('UTA Branch', '123 Cooper St, Arlington, TX 76101');
sqlite> SELECT * FROM LIBRARY_BRANCH;
1|Main Branch|123 Main St, New York, NY 10003
2|West Branch|456 West St, Arizona, AR 70622
3|East Branch|789 East St, New Jersey, NJ 32032
|North Branch|456 NW, Irving, TX 76100
|UTA Branch|123 Cooper St, Arlington, TX 76101
sqlite> []
```

───●

Question 5: Return all Books that were loaned between March 5, 2022 until March 23, 2022. List Book title and Branch name, and how many days it was borrowed for. [10 points]

```
SELECT BOOK.Title, LIBRARY_BRANCH.Branch_Name,
JULIANDAY(COALESCE(BOOK_LOANS.Returned_Date, DATE('now'))) -
JULIANDAY(BOOK_LOANS.Date_Out)
FROM BOOK_LOANS
JOIN BOOK ON BOOK_LOANS.Book_ID = BOOK.Book_ID
JOIN LIBRARY_BRANCH ON BOOK_LOANS.Branch_ID = LIBRARY_BRANCH.Branch_ID
WHERE BOOK_LOANS.Date_Out BETWEEN '2022-03-05' AND '2022-03-23';
```

2 records returned as they were borrowed between the dates A challenge we faced was dates that we were given were not in the format of year/month/date, so once we figured that out we changed it and got our result.

```
45    (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
46    (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
47    (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
48
49    INSERT INTO BOOK (Book_ID, Title, Publisher) VALUES
50    (1, 'To Kill a Mockingbird', 'HarperCollins'),
51    (2, '1984', 'Penguin Books'),
52    (3, 'Pride and Prejudice', 'Penguin Classics'),
53    (4, 'The Great Gatsby', 'Scribner'),
54    (5, 'One Hundred Years of Solitude', 'Harper & Row'),
55    (6, 'Animal Farm', 'Penguin Books'),
56    (7, 'The Catcher in the Rye', 'Little, Brown and Company'),
57    (8, 'Lord of the Flies', 'Faber and Faber'),
58    (9, 'Brave New World', 'Chatto & Windus'),
59    (10, 'The Picture of Dorian Gray', 'Ward, Lock and Co.'),
60    (11, 'The Alchemist', 'HarperCollins'),
61    (12, 'The God of Small Things', 'Random House India'),
62    (13, 'Wuthering Heights', 'Thomas Cautley Newby'),
63    (14, 'The Hobbit', 'Allen & Unwin'),
64    (15, 'The Lord of the Rings', 'Allen & Unwin'),
65    (16, 'The Hitchhiker's Guide to the Galaxy', 'Pan Books'),
66    (17, 'The Diary of a Young Girl', 'Bantam Books'),
67    (18, 'The Da Vinci Code', 'Doubleday'),
68    (19, 'The Adventures of Huckleberry Finn', 'Penguin Classics'),
69    (20, 'The Adventures of Tom Sawyer', 'American Publishing Company'),
70    (21, 'A Tale of Two Cities', 'Chapman and Hall');
71
72
73    INSERT INTO BOOK_LOANS (Book_ID, Branch_ID, Card_No, Date_Out, Due_Date, Returned_Date) VALUES
74    (1, 1, 123456, '2022-01-01', '2022-02-01', '2022-02-01'),
75    (2, 1, 789012, '2022-01-02', '2022-02-02', NULL),
76    (3, 2, 345678, '2022-01-03', '2022-02-03', NULL),
77    (4, 3, 901234, '2022-01-04', '2022-02-04', '2022-02-04'),
```

```
sqlite> SELECT BOOK.Title, LIBRARY_BRANCH.Branch_Name, JULIANDAY(COALESCE(BOOK_LOANS.Returned_Date, DATE('now'))) - JULIANDAY(BOOK_LOANS.Date_Out)
   ...> FROM BOOK_LOANS
   ...> JOIN BOOK ON BOOK_LOANS.Book_ID = BOOK.Book_ID
   ...> JOIN LIBRARY_BRANCH ON BOOK_LOANS.Branch_ID = LIBRARY_BRANCH.Branch_ID
   ...> WHERE BOOK_LOANS.Date_Out BETWEEN '2022-03-05' AND '2022-03-23';
The Hitchhiker's Guide to the Galaxy|West Branch|19.0
The Diary of a Young Girl|East Branch|7.0
sqlite>
```

———●

Question 6: Return a List borrower names that have books not returned.   [3 points]

```
SELECT BORROWER.Name
FROM BORROWER
JOIN BOOK_LOANS ON BORROWER.Card_No = BOOK_LOANS.Card_No
WHERE BOOK_LOANS.Returned_Date IS NULL;
```

2 records returned as they have not returned their books

```
26    INSERT INTO BORROWER (Card_No, Name, Address, Phone) VALUES
27    (123456, 'John Smith', '456 Oak St, Arizona, AR 70010', '205-555-5555'),
28    (789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
29    (345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
30    (901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
31    (567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
32    (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
33    (890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
34    (456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
35    (111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
36    (222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
37    (333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
38    (444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
39    (555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
40    (565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
41    (676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
42    (787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
43    (989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
44    (121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
45    (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
46    (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
47    (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
48
49    INSERT INTO BOOK (Book_ID, Title, Publisher) VALUES
50    (1, 'To Kill a Mockingbird', 'HarperCollins'),
51    (2, '1984', 'Penguin Books'),
52    (3, 'Pride and Prejudice', 'Penguin Classics'),
53    (4, 'The Great Gatsby', 'Scribner'),
54    (5, 'One Hundred Years of Solitude', 'Harper & Row'),
55    (6, 'Animal Farm', 'Penguin Books'),
56    (7, 'The Catcher in the Rye', 'Little, Brown and Company'),
57    (8, 'Lord of the Flies', 'Faber and Faber'),
58    (9, 'Brave New World', 'Chatto & Windus'),
59    (10, 'The Picture of Dorian Gray', 'Ward, Lock and Co.'),
```

```
sqlite> SELECT BORROWER.Name
   ...> FROM BORROWER
   ...> JOIN BOOK_LOANS ON BORROWER.Card_No = BOOK_LOANS.Card_No
   ...> WHERE BOOK_LOANS.Returned_Date IS NULL;
Jane Doe
Bob Johnson
sqlite>
```

——●

Question 7: Create a report that will return all branches with the number of books borrowed per branch separated by if they have been returned, still borrowed, or late.   [15 points]

```
SELECT LIBRARY_BRANCH.Branch_Name, SUM(CASE WHEN
BOOK_LOANS.Returned_Date IS NOT NULL THEN 1 ELSE 0 END),
SUM(CASE WHEN BOOK_LOANS.Returned_Date IS NULL AND BOOK_LOANS.Due_Date
>= DATE('now') THEN 1 ELSE 0 END), SUM(CASE WHEN
BOOK_LOANS.Returned_Date IS NULL AND BOOK_LOANS.Due_Date < DATE('now')
THEN 1 ELSE 0 END)
FROM LIBRARY_BRANCH
JOIN BOOK_LOANS ON LIBRARY_BRANCH.Branch_ID = BOOK_LOANS.Branch_ID
GROUP BY LIBRARY_BRANCH.Branch_Name;

3 records returned, one for each branch, and it shows how many are
returned, still borrowed, or late
```

●--

Question 8: List all the books (title) and the maximum number of days that they were borrowed.
[15 points]

```
SELECT BOOK.Title, CASE WHEN BOOK_LOANS.Returned_Date IS NOT NULL THEN
JULIANDAY(BOOK_LOANS.Returned_Date) - JULIANDAY(BOOK_LOANS.Date_Out)
ELSE NULL END
FROM BOOK
JOIN BOOK_LOANS ON BOOK.Book_ID = BOOK_LOANS.Book_ID
GROUP BY BOOK.Title;
```

21 records returned as it shows every book and the longest its been
borrowed in days

```
sqlite> SELECT BOOK.Title, CASE WHEN BOOK_LOANS.Returned_Date IS NOT NULL THEN JULIANDAY(BOOK_LOANS.Returned_Date) - JULIANDAY(BOOK_LOANS.Date_Out)
   ELSE NULL END
   ...> FROM BOOK
   ...> JOIN BOOK_LOANS ON BOOK.Book_ID = BOOK_LOANS.Book_ID
   ...> GROUP BY BOOK.Title;
1984|
A Tale of Two Cities|31.0
Animal Farm|35.0
Brave New World|28.0
Lord of the Flies|61.0
One Hundred Years of Solitude|35.0
Pride and Prejudice|
The Adventures of Huckleberry Finn|7.0
The Adventures of Tom Sawyer|31.0
The Alchemist|7.0
The Catcher in the Rye|60.0
The Da Vinci Code|31.0
The Diary of a Young Girl|7.0
The God of Small Things|7.0
The Great Gatsby|31.0
The Hitchhiker's Guide to the Galaxy|19.0
The Hobbit|76.0
The Lord of the Rings|37.0
The Picture of Dorian Gray|28.0
To Kill a Mockingbird|31.0
Wuthering Heights|15.0
sqlite>
```

——

- **Question 9:** Create a report for Ethan Martinez with all the books they borrowed. List the book title and author. Also, calculate the number of days each book was borrowed for and if any book is late being returned. Order the results by the date_out. [6 points]

```
SELECT BOOK.Title, AUTHOR.Author_Name,
JULIANDAY(COALESCE(BOOK_LOANS.Returned_Date, 'now')) -
JULIANDAY(BOOK_LOANS.Date_Out), CASE WHEN BOOK_LOANS.Due_Date <
COALESCE(BOOK_LOANS.Returned_Date, 'now') THEN 'Late' ELSE 'Not Late'
END
FROM BOOK_LOANS
JOIN BOOK ON BOOK_LOANS.Book_ID = BOOK.Book_ID
JOIN AUTHOR ON BOOK.Book_ID = AUTHOR.Book_ID JOIN
BORROWER ON BOOK_LOANS.Card_No = BORROWER.Card_No
WHERE BORROWER.Name = 'Ethan Martinez'
ORDER BY BOOK_LOANS.Date_Out;

1 record returned from Ethan Martinez
```

```
32  (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
33  (890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
34  (456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
35  (111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
36  (222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
37  (333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
38  (444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
39  (555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
40  (565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
41  (676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
42  (787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
43  (989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
44  (121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
45  (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
46  (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
47  (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
48
49  INSERT INTO BOOK (Book_ID, Title, Publisher) VALUES
50  (1, 'To Kill a Mockingbird', 'HarperCollins'),
51  (2, '1984', 'Penguin Books'),
52  (3, 'Pride and Prejudice', 'Penguin Classics'),
53  (4, 'The Great Gatsby', 'Scribner'),
54  (5, 'One Hundred Years of Solitude', 'Harper & Row'),
55  (6, 'Animal Farm', 'Penguin Books'),
56  (7, 'The Catcher in the Rye', 'Little, Brown and Company'),
57  (8, 'Lord of the Flies', 'Faber and Faber'),
58  (9, 'Brave New World', 'Chatto & Windus'),
59  (10, 'The Picture of Dorian Gray', 'Ward, Lock and Co.'),
60  (11, 'The Alchemist', 'HarperCollins'),
61  (12, 'The God of Small Things', 'Random House India'),
62  (13, 'Wuthering Heights', 'Thomas Cautley Newby'),
63  (14, 'The Hobbit', 'Allen & Unwin'),
```

```
sqlite> SELECT BOOK.Title, AUTHOR.Author_Name, JULIANDAY(COALESCE(BOOK_LOANS.Returned_Date, 'now')) - JULIANDAY(BOOK_LOANS.Date_Out), CASE WHEN BOO
K_LOANS.Due_Date < COALESCE(BOOK_LOANS.Returned_Date, 'now') THEN 'Late' ELSE 'Not Late' END
   ...> FROM BOOK_LOANS
   ...> JOIN BOOK ON BOOK_LOANS.Book_ID = BOOK.Book_ID
   ...> JOIN AUTHOR ON BOOK.Book_ID = AUTHOR.Book_ID
   ...> JOIN BORROWER ON BOOK_LOANS.Card_No = BORROWER.Card_No
   ...> WHERE BORROWER.Name = 'Ethan Martinez'
   ...> ORDER BY BOOK_LOANS.Date_Out;
The God of Small Things|Arundhati Roy|7.0|Not Late
sqlite>
```

--●

Question 10: Return the names of all borrowers that borrowed a book from the West Branch include their addresses. [3 points]

```
SELECT BORROWER.Name, BORROWER.Address
FROM BORROWER
JOIN BOOK_LOANS ON BORROWER.Card_No = BOOK_LOANS.Card_No
JOIN LIBRARY_BRANCH ON BOOK_LOANS.Branch_ID = LIBRARY_BRANCH.Branch_ID
WHERE LIBRARY_BRANCH.Branch_Name = 'West Branch';
```

4 records returned as those people borrowed books from the West Branch.

```
18   ('Chapman and Hall', '833-342-2343', '789 Oak St, Texas, TX 76010');
19
20
21   INSERT INTO LIBRARY_BRANCH (Branch_ID, Branch_Name, Branch_Address) VALUES
22   (1, 'Main Branch', '123 Main St, New York, NY 10003'),
23   (2, 'West Branch', '456 West St, Arizona, AR 70622'),
24   (3, 'East Branch', '789 East St, New Jersey, NJ 32032');
25
26   INSERT INTO BORROWER (Card_No, Name, Address, Phone) VALUES
27   (123456, 'John Smith', '456 Oak St, Arizona, AR 70010', '205-555-5555'),
28   (789012, 'Jane Doe', '789 Maple Ave, New Jersey, NJ 32542', '555-235-5556'),
29   (345678, 'Bob Johnson', '12 Elm St, Arizona, AR 70345', '545-243-5557'),
30   (901234, 'Sarah Kim', '345 Pine St, New York, NY 10065', '515-325-2158'),
31   (567890, 'Tom Lee', '678 S Oak St, New York, NY 10045', '209-525-5559'),
32   (234567, 'Emily Lee', '389 Oaklay St, Arizona, AR 70986', '231-678-5560'),
33   (890123, 'Michael Park', '123 Pinewood St, New Jersey, NJ 32954', '655-890-2161'),
34   (456789, 'Laura Chen', '345 Mapman Ave, Arizona, AR 70776', '565-985-9962'),
35   (111111, 'Alex Kim', '983 Sine St, Arizona, AR 70451', '678-784-5563'),
36   (222222, 'Rachel Lee', '999 Apple Ave, Arizona, AR 70671', '231-875-5564'),
37   (333333, 'William Johnson', '705 Paster St, New Jersey, NJ 32002', '235-525-5567'),
38   (444444, 'Ethan Martinez', '466 Deeplm St, New York, NY 10321', '555-555-5569'),
39   (555555, 'Grace Hernandez', '315 Babes St, Arizona, AR 70862', '455-567-5587'),
40   (565656, 'Sophia Park', '678 Dolphin St, New York, NY 10062', '675-455-5568'),
41   (676767, 'Olivia Lee', '345 Spine St, New York, NY 10092', '435-878-5569'),
42   (787878, 'Noah Thompson', '189 GreenOak Ave, New Jersey, NJ 32453', '245-555-5571'),
43   (989898, 'Olivia Smith', '178 Elm St, New Jersey, NJ 32124', '325-500-5579'),
44   (121212, 'Dylan Kim', '345 Shark St, Arizona, AR 72213', '755-905-5572'),
45   (232323, 'William Chen', '890 Sting St, New York, NY 10459', '406-755-5580'),
46   (343434, 'Olivia Johnson', '345 Pine St, New Jersey, NJ 32095', '662-554-5575'),
47   (454545, 'Dylan Kim', '567 Cowboy way St, New Jersey, NJ 32984', '435-254-5578');
48
```

```
sqlite> SELECT BORROWER.Name, BORROWER.Address
   ...> FROM BORROWER
   ...> JOIN BOOK_LOANS ON BORROWER.Card_No = BOOK_LOANS.Card_No
   ...> JOIN LIBRARY_BRANCH ON BOOK_LOANS.Branch_ID = LIBRARY_BRANCH.Branch_ID
   ...> WHERE LIBRARY_BRANCH.Branch_Name = 'West Branch';
Bob Johnson|12 Elm St, Arizona, AR 70345
Emily Lee|389 Oaklay St, Arizona, AR 70986
Michael Park|123 Pinewood St, New Jersey, NJ 32954
Rachel Lee|999 Apple Ave, Arizona, AR 70671
Noah Thompson|189 GreenOak Ave, New Jersey, NJ 32453
sqlite>
```

EXPLANATION OF COMMENTS, SPECIFIC DATA TYPES, AND CONSTRAINTS

Each table corresponds to an entity in the library system which are PUBLISHER, LIBRARY_BRANCH, BORROWER, BOOK, BOOK_LOANS, BOOK_COPIES, and AUTHOR.

- Variables: Used VARCHAR for variable-length text fields like Name, Title, and Address to save space while accommodating various lengths. CHAR is used for fixed-length fields like Phone. Also used INT for numeric fields like Card_No, Branch_ID, and Book_ID as they are typically integer values. Used DATE type for fields such as Date_Out, Due_Date, and Returned_Date to support date-specific values.
- Primary Key: Example of primary keys in database: Name in Publisher, Branch_ID in Library_Branch, and composite keys like (Book_ID, Branch_ID, Card_No) in Book_Loans.
- Foreign Keys Ensures referential integrity by linking tables through attributes. Example: Publisher in Book references Name in Publisher.
- Constraints: Included PRIMARY KEY and FOREIGN KEY constraints to enforce data integrity.
- Data Type Decisions:Example: VARCHAR(100) for names and addresses allows flexibility in length while setting a reasonable limit; while, CHAR(12) for phone numbers enforces a fixed format (e.g., (XXX) XXX-XXXX).