

## Part 1. Creating Tables:

### Book

```
CREATE TABLE dbo.Book
(
    BookID INT NOT NULL
    ,Title VARCHAR(100) NOT NULL
    ,PublisherID INT NOT NULL
);
```

### BookAuthors

```
CREATE TABLE dbo.BookAuthors
(
    BookID INT NOT NULL
    ,AuthorName VARCHAR(100) NOT NULL
);
```

### BookCopies

```
CREATE TABLE dbo.BookCopies
(
    BookID INT NOT NULL
    ,BranchID INT NOT NULL
    ,NumOfCopies INT NOT NULL
);
```

### BookLoans

```
CREATE TABLE dbo.BookLoans
(
    BookID INT NOT NULL
    ,BranchID INT NOT NULL
    ,CardNo INT NOT NULL
    ,DateOut DATE NULL
    ,DueDate DATE NULL
);
```

## **Publisher**

```
CREATE TABLE dbo.Publisher
(
    PublisherID INT NOT NULL
    ,PublisherName VARCHAR(150) NOT NULL
    ,PublisherAddress VARCHAR (200) NOT NULL
    ,PublisherPhone INT NULL
);
```

## **LibraryBranch**

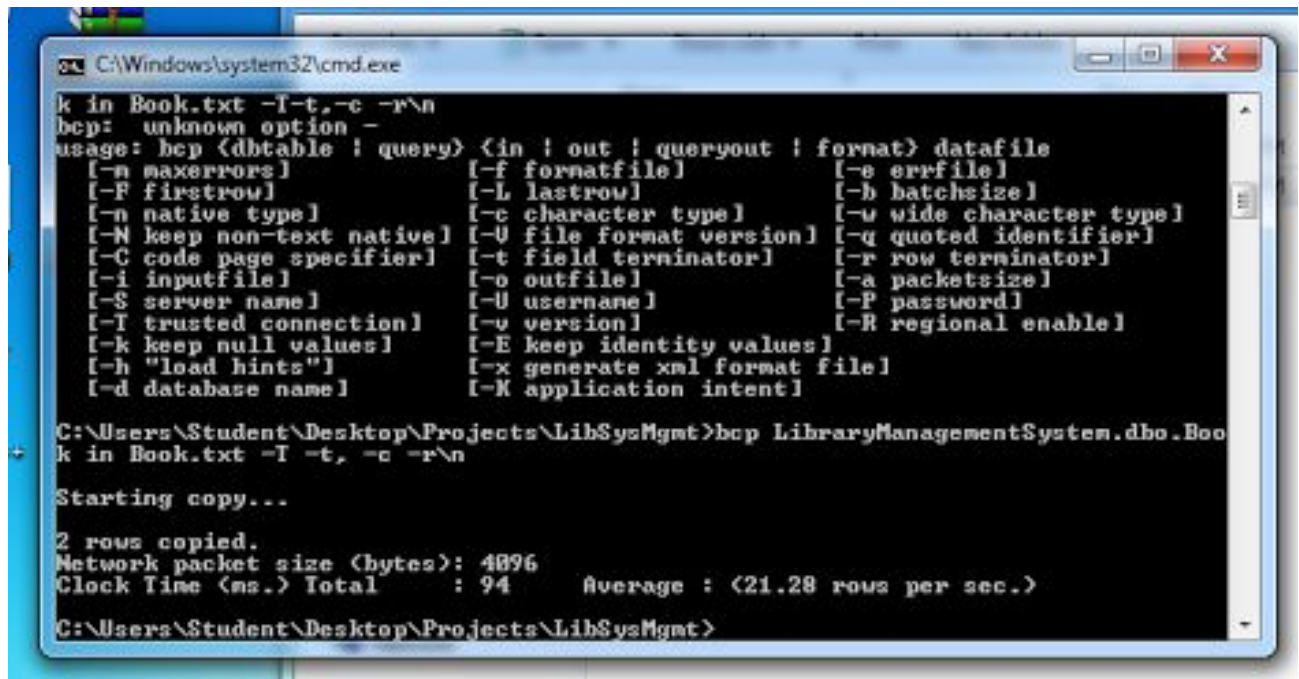
```
CREATE TABLE dbo.LibraryBranch
(
    BranchID INT NOT NULL
    ,BranchName VARCHAR(100) NOT NULL
    ,BranchAddress VARCHAR (200) NOT NULL
);
```

## **Borrower**

```
CREATE TABLE dbo.Borrower
(
    CardNo INT NOT NULL
    ,BorrowerName VARCHAR(100) NOT NULL
    ,BorrowerAddress VARCHAR(200) NOT NULL
    ,BorrowerPhone INT NULL
);
```

## Part 2. Inserting Data into Tables

### A. BCP command that works to import data to tables:



```
C:\Windows\system32\cmd.exe

k in Book.txt -I -t, -c -r\n
bcp: unknown option -
usage: bcp {dbtable | query} {in | out | queryout | format} datafile
[-n maxerrors] [-f formatfile] [-e errfile]
[-F firstrow] [-L lastrow] [-b batchsize]
[-n native type] [-c character type] [-u wide character type]
[-N keep non-text native] [-U file format version] [-q quoted identifier]
[-C code page specifier] [-t field terminator] [-r row terminator]
[-i inputfile] [-o outfile] [-a packetsize]
[-S server name] [-U username] [-P password]
[-T trusted connection] [-v version] [-R regional enable]
[-k keep null values] [-E keep identity values]
[-h "load hints"] [-x generate xml format file]
[-d database name] [-K application intent]

C:\Users\Student\Desktop\Projects\LibSysMgmt>bcp LibraryManagementSystem.dbo.Boo
k in Book.txt -I -t, -c -r\n

Starting copy...

2 rows copied.
Network packet size (bytes): 4096
Clock Time (ms.) Total : 94 Average : (21.28 rows per sec.)

C:\Users\Student\Desktop\Projects\LibSysMgmt>
```

### B. SQL command for putting data in table from New Query:

```
INSERT INTO BookLoans (BookID, BranchID, CardNo, DateOut, DueDate)
VALUES (15,3,1256,'2016-06-24','2016-07-24');
```

## Part 3. Questions

1. How many copies of the book titled The Lost Tribe are owned by the library branch whose name is "Sharpstown"?

Query:

```
SELECT B.Title, C.NumOfCopies, L.BranchName
FROM LibraryBranch AS L
    INNER JOIN BookCopies AS C
    ON L.BranchID = C.BranchID
    INNER JOIN Book AS B
    ON C.BookID = B.BookID
WHERE L.BranchID = 1
AND B.BookID = 1
```

Returns:

Results			
Messages			
	Title	NumOfCopies	BranchName
1	The Lost Tribe	2	Sharpstown Branch

Query executed succ... | STUDENT-PC (11.0 RTM) | Student-PC\Student (53) | LibraryManagementSystem | 00:00:00 | 1 rows

**2. How many copies of the book titled The Lost Tribe are owned by each library branch?**

Query:

```
SELECT B.Title, C.NumOfCopies, L.BranchName
FROM LibraryBranch AS L
    INNER JOIN BookCopies AS C
    ON L.BranchID = C.BranchID
    INNER JOIN Book AS B
    ON C.BookID = B.BookID
WHERE L.BranchID <=4
AND B.BookID = 1
```

Returns:

Results			
Messages			
	Title	NumOfCopies	BranchName
1	The Lost Tribe	2	Sharpstown Branch
2	The Lost Tribe	2	Central Branch
3	The Lost Tribe	2	Western Branch
4	The Lost Tribe	2	Eastern Branch

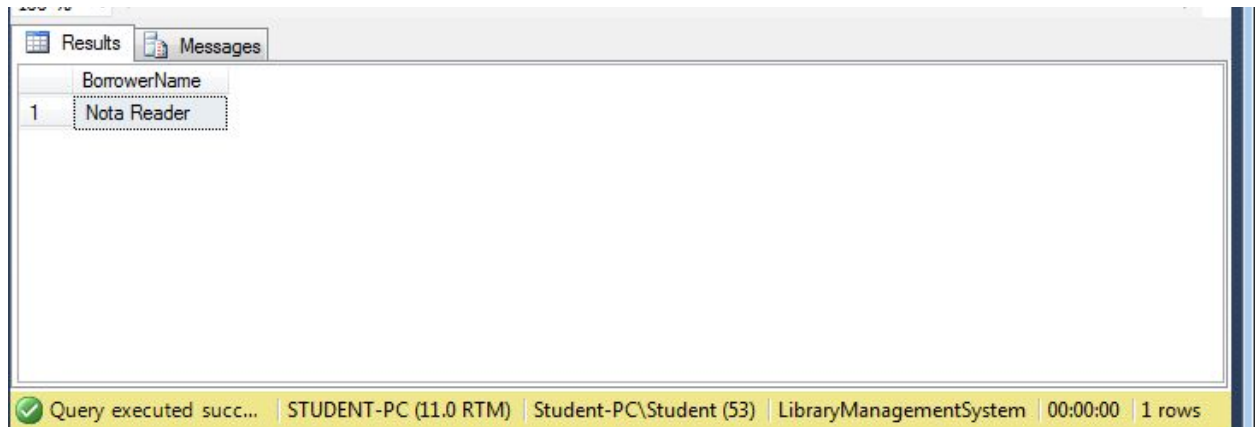
Query executed succ... | STUDENT-PC (11.0 RTM) | Student-PC\Student (53) | LibraryManagementSystem | 00:00:00 | 4 rows

**3. Retrieve the names of all borrowers who do not have any books checked out.**

Query:

```
SELECT R.BorrowerName
FROM BookLoans AS L
      RIGHT OUTER JOIN Borrower AS R
      ON L.CardNo=R.CardNo
WHERE L.DateOut IS NULL
```

Returns:



The screenshot shows a database application window with a 'Results' tab. The results are displayed in a table with one column, 'BorrowerName', and one row containing the value 'Nota Reader'. The status bar at the bottom indicates 'Query executed succ...', 'STUDENT-PC (11.0 RTM)', 'Student-PC\Student (53)', 'LibraryManagementSystem', '00:00:00', and '1 rows'.

BorrowerName
1 Nota Reader

**4. For each book that is loaned out from the "Sharpstown" branch and whose DueDate is today, retrieve the book title, the borrower's name, and the borrower's address.**

Query:

```
SELECT B.Title, R.BorrowerName, R.BorrowerAddress
FROM BookLoans AS L
      INNER JOIN Book AS B
      ON L.BookID = B.BookID
      INNER JOIN Borrower AS R
      ON L.CardNo = R.CardNo
WHERE BranchID = 1
AND DueDate = '2016-11-21'
```

*NOTE: I didn't enter any return dates of today, so I pretended 'today' was 2016-11-21 so I had some data to show.*

Returns:

Results			
Messages			
	Title	BorrowerName	BorrowerAddress
1	'The Lost Tribe'	John Doe	1937 Packard Lane
2	'Don Quixote'	John Doe	1937 Packard Lane

Query executed succ... | STUDENT-PC (11.0 RTM) | Student-PC\Student (53) | LibraryManagementSystem | 00:00:00 | 2 rows

**5. For each library branch, retrieve the branch name and the total number of books loaned out from that branch.**

Query:

```
SELECT R.BranchName, COUNT(R.BranchName)
AS BooksOut
FROM LibraryBranch AS R
      INNER JOIN BookLoans AS L
      ON R.BranchID = L.BranchID
GROUP BY R.BranchName
```

Returns:

Results		
Messages		
	BranchName	BooksOut
1	Central Branch	15
2	Eastern Branch	15
3	Sharpstown Branch	15
4	Western Branch	15

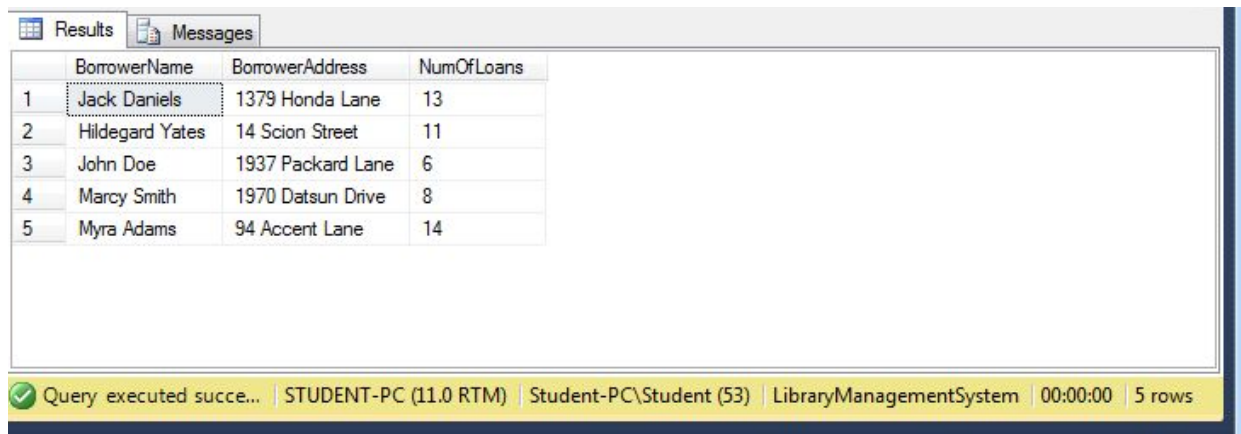
Query executed succe... | STUDENT-PC (11.0 RTM) | Student-PC\Student (53) | LibraryManagementSystem | 00:00:00 | 4 rows

**6. Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out.**

Query:

```
SELECT B.BorrowerName, B.BorrowerAddress,
COUNT(L.CardNo)
AS NumOfLoans
FROM (Borrower AS B
      INNER JOIN BookLoans AS L
      ON B.CardNo = L.CardNo)
GROUP BY B.BorrowerName, B.BorrowerAddress
HAVING COUNT(L.CardNo) > 5
```

Returns:



The screenshot shows a database application window with two tabs: 'Results' and 'Messages'. The 'Results' tab is active, displaying a table with the following data:

	BorrowerName	BorrowerAddress	NumOfLoans
1	Jack Daniels	1379 Honda Lane	13
2	Hildegard Yates	14 Scion Street	11
3	John Doe	1937 Packard Lane	6
4	Marcy Smith	1970 Datsun Drive	8
5	Myra Adams	94 Accent Lane	14

At the bottom of the window, a status bar indicates: 'Query executed succe...' (partially visible), 'STUDENT-PC (11.0 RTM)', 'Student-PC\Student (53)', 'LibraryManagementSystem', '00:00:00', and '5 rows'.

**7. For each book authored (or co-authored) by "Stephen King", retrieve the title and the number of copies owned by the library branch whose name is "Central."**

Query:

```
SELECT A.AuthorName, B.Title, C.NumOfCopies, L.BranchName
FROM BookAuthors AS A
      INNER JOIN BookCopies AS C
      ON A.BookID = C.BookID
      INNER JOIN LibraryBranch AS L
      ON C.BranchID = L.BranchID
      INNER JOIN Book AS B
      ON A.BookID = B.BookID
WHERE A.AuthorName = 'Stephen King'
AND L.BranchName = 'Central Branch'
```

Returns:

Results		Messages		
	AuthorName	Title	NumOfCopies	BranchName
1	Stephen King	'It'	2	Central Branch

Query executed succe... | STUDENT-PC (11.0 RTM) | Student-PC\Student (53) | LibraryManagementSystem | 00:00:00 | 1 rows

#### Part 4. Stored Proecdure

My stored procedure lists the books due on a given date at a given branch. I thought this would be a useful report for a librarian who needed to follow up with patrons whose books were due. It requires the librarian to input the name of branch and the date (in YYYY-MM-DD format) and returns the books due on that date, who has the books, and how to contact that borrower.

Here's the code I wrote to create the procedure:

```
CREATE PROC [dbo].[DailyDueByBranch] @Branch varchar(100), @Today date
AS
SELECT B.Title, N.BranchName, R.BorrowerName, R.BorrowerAddress, R.BorrowerPhone
FROM BookLoans AS L
    INNER JOIN LibraryBranch AS N
    ON L.BranchID = N.BranchID
    INNER JOIN Book AS B
    ON L.BookID = B.BookID
    INNER JOIN Borrower AS R
    ON L.CardNo = R.CardNo
WHERE N.BranchName = @Branch
AND DueDate = @Today
```

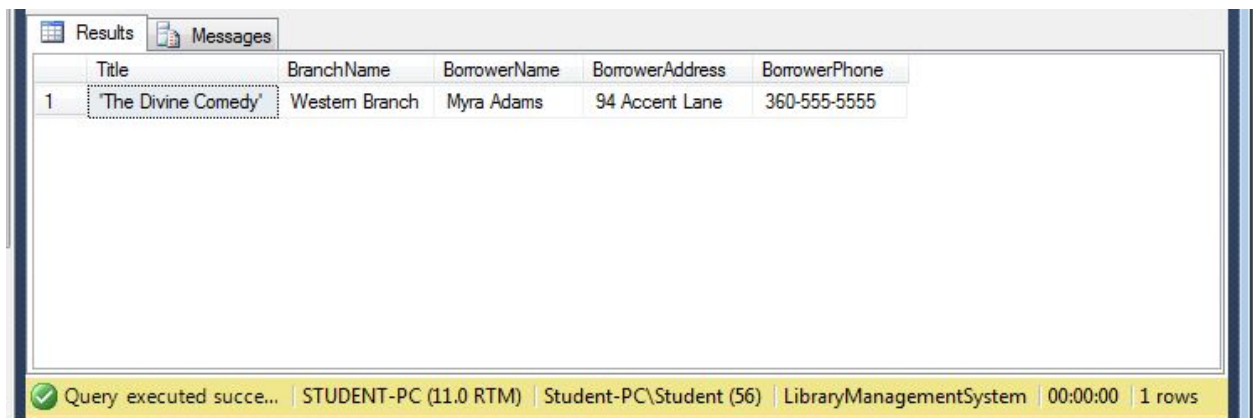
To test this, I entered the following code:

```
EXEC dbo.DailyDueByBranch 'Western Branch','2016-03-15'
```

Which should return information on the books due on the Ides of March, 2016.



The results show that the Ides of March is potentially an unlucky day for Myra Adams - she won't be laughing at 'The Divine Comedy' if she gets a fine:



The screenshot shows a database application window with two tabs: 'Results' and 'Messages'. The 'Results' tab is active, displaying a table with the following data:

	Title	BranchName	BorrowerName	BorrowerAddress	BorrowerPhone
1	'The Divine Comedy'	Western Branch	Myra Adams	94 Accent Lane	360-555-5555

At the bottom of the window, a status bar provides additional information:

✓ Query executed succe... | STUDENT-PC (11.0 RTM) | Student-PC\Student (56) | LibraryManagementSystem | 00:00:00 | 1 rows