

# Database Creation and Data Population

Submitted by : Maya Babu

## Creating Database

```
Maya_ASQL_Project.s...M.dbtest (sa (60)) X
18  /*Create database*/
19  create database db_libManagement
20
21  use db_libManagement
22  go
23
110 %
Messages
Commands completed successfully.
Completion time: 2024-05-12T00:07:42.7107434-04:00
```

## Table publisher

```
26  create table tbl_publisher(
27  publisher_PublisherName varchar(100) primary key,
28  publisher_PublisherAddress varchar(200),
29  publisher_PublisherPhone varchar(50))
30
31  insert into tbl_publisher (publisher_PublisherName,publisher_PublisherAddress,publisher_PublisherPhone)
32  values
33  ('DAW Books','375 Hudson Street, New York, NY 10014','212-366-2000'),
34  ('Viking','375 Hudson Street, New York, NY 10014','212-366-2000'),
35  ('Signet Books','375 Hudson Street, New York, NY 10014','212-366-2000'),
36  ('Chilton Books','Not Available','Not Available'),
37  ('George Allen & Unwin','83 Alexander Ln, Crows Nest NSW 2065, Australia','+61-2-8425-0100'),
38  ('Alfred A. Knopf','The Knopf Doubleday Group Domestic Rights, 1745 Broadway, New York, NY 10019','212-940-7390'),
39  ('Bloomsbury','Bloomsbury Publishing Inc., 1385 Broadway, 5th Floor, New York, NY 10018','212-419-5300'),
40  ('Shinchosa','Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo 101-0064 Japan','+81-3-5577-6507'),
%
Results Messages
publisher_PublisherName publisher_PublisherAddress publisher_PublisherPhone
Alfred A. Knopf The Knopf Doubleday Group Domestic Rights, 1745 ... 212-940-7390
Bantam 375 Hudson Street, New York, NY 10014 212-366-2000
Bloomsbury Bloomsbury Publishing Inc., 1385 Broadway, 5th Floo... 212-419-5300
Chalto & Windus 375 Hudson Street, New York, NY 10014 212-366-2000
Chilton Books Not Available Not Available
DAW Books 375 Hudson Street, New York, NY 10014 212-366-2000
George Allen & Unwin 83 Alexander Ln, Crows Nest NSW 2065, Australia +61-2-8425-0100
Harcourt Brace Jovanovich 3 Park Ave, New York, NY 10016 212-420-5800
Harper and Row HarperCollins Publishers, 195 Broadway, New York, ... 212-207-7000
Pan Books 175 Fifth Avenue, New York, NY 10010 646-307-5745
Picador USA 175 Fifth Avenue, New York, NY 10010 646-307-5745
Scholastic 557 Broadway, New York, NY 10012 800-724-6527
Shinchosa Oga Bldg. 8, 2-5-4 Sarugaku-cho, Chiyoda-ku, Tokyo ... +81-3-5577-6507
Signet Books 375 Hudson Street, New York, NY 10014 212-366-2000
Viking 375 Hudson Street, New York, NY 10014 212-366-2000
W.W. Norton W. W. Norton & Company, Inc., 500 Fifth Avenue, Ne... 212-354-5500
```

## Table Book

```

53 create table tbl_book(
54     book_BookID int primary key,
55     book_Title varchar(100),
56     book_PublisherName varchar(100) constraint FK1 foreign key references tbl_publisher(publisher_PublisherName))
57
58 insert into tbl_book (book_BookID, book_Title, book_PublisherName)
59 values
60     (1,'The Name of the Wind', 'DAW Books'),
61     (2,'It', 'Viking'),
62     (3,'The Green Mile', 'Signet Books'),
63     (4,'Dune', 'Chilton Books'),
64     (5,'The Hobbit', 'George Allen & Unwin'),
65     (6,'Eragon', 'Alfred A. Knopf'),

```

	book_BookID	book_Title	book_PublisherName
1	1	The Name of the Wind	DAW Books
2	2	It	Viking
3	3	The Green Mile	Signet Books
4	4	Dune	Chilton Books
5	5	The Hobbit	George Allen & Unwin
6	6	Eragon	Alfred A. Knopf
7	7	A Wise Mans Fear	DAW Books
8	8	Harry Potter and the ...	Bloomsbury
9	9	Hard Boiled Wonderl...	Shinchosa
10	10	The Giving Tree	Harper and Row
11	11	The Hitchhikers Guid...	Pan Books
12	12	Brave New World	Chalto & Windus
13	13	The Princess Bride	Harcourt Brace Jova...
14	14	Fight Club	W.W. Norton
15	15	Holes	Scholastic
16	16	Harry Potter and the ...	Bloomsbury
17	17	Harry Potter and the ...	Bloomsbury
18	18	The Fellowship of th...	George Allen & Unwin
19	19	A Game of Thrones	Bantam
20	20	The Lost Tribe	Picador USA

## Table Authors

```

83
84 create table tbl_book_authors(
85     book_authors_AuthorID int primary key,
86     book_authors_BookID int constraint FK2 foreign key references tbl_book(book_BookID),
87     book_authors_AuthorName varchar(100))
88
89 insert into tbl_book_authors (book_authors_AuthorID, book_authors_BookID,book_authors_AuthorName)
90 values
91     (1,'1','Patrick Rothfuss'),
92     (2,'2','Stephen King'),
93     (3,'3','Stephen King'),
94     (4,'4','Frank Herbert'),
95     (5,'5','J.R.R. Tolkien'),

```

	book_authors_AuthorID	book_authors_BookID	book_authors_AuthorName
1	1	1	Patrick Rothfuss
2	2	2	Stephen King
3	3	3	Stephen King
4	4	4	Frank Herbert
5	5	5	J.R.R. Tolkien
6	6	6	Christopher Paolini
7	7	6	Patrick Rothfuss
8	8	8	J.K. Rowling
9	9	9	Haruki Murakami
10	10	10	Shel Silverstein
11	11	11	Douglas Adams
12	12	12	Aldous Huxley
13	13	13	William Goldman
14	14	14	Chuck Palahniuk
15	15	15	Louis Sachar
16	16	16	J.K. Rowling
17	17	17	J.K. Rowling
18	18	18	J.R.R. Tolkien
19	19	19	George R.R. Martin
20	20	20	Mark Lee

## Table Library Branch

```
115 create table tbl_library_branch(  
116     library_branch_BranchID int primary key,  
117     library_branch_BranchName varchar(100),  
118     library_branch_BranchAddress varchar(200))  
119  
120 insert into tbl_library_branch (library_branch_BranchID, library_branch_BranchName, library_branch_BranchAddress)  
121 values  
122     (1, 'Sharpstown', '32 Corner Road, New York, NY 10012'),  
123     (2, 'Central', '491 3rd Street, New York, NY 10014'),  
124     (3, 'Saline', '40 State Street, Saline, MI 48176'),  
125     (4, 'Ann Arbor', '101 South University, Ann Arbor, MI 48104')  
126  
127 select * from tbl_library_branch  
128
```

Results Messages

library_branch_BranchID	library_branch_BranchName	library_branch_BranchAddress
1	Sharpstown	32 Corner Road, New York, NY 10012
2	Central	491 3rd Street, New York, NY 10014
3	Saline	40 State Street, Saline, MI 48176
4	Ann Arbor	101 South University, Ann Arbor, MI 48104

## Table Book Copies

```
129  
130 create table tbl_book_copies(  
131     book_copies_CopiesID int primary key,  
132     book_copies_BookID int constraint FK3 foreign key references tbl_book(book_BookID),  
133     book_copies_BranchID int constraint FK4 foreign key references tbl_library_branch(library_branch_BranchID),  
134     book_copies_No_Of_Copies int)  
135  
136 insert into tbl_book_copies (book_copies_CopiesID, book_copies_BookID, book_copies_BranchID, book_copies_No_Of_Copies)  
137 values  
138     (1, '1', '1', '5'),  
139     (2, '2', '1', '5'),  
140     (3, '3', '1', '5'),  
141     (4, '4', '1', '5'),  
142     (5, '5', '1', '5'),  
143     (6, '6', '1', '5'),  
144     (7, '7', '1', '5'),  
145     (8, '8', '1', '5').
```

Results Messages

book_copies_CopiesID	book_copies_BookID	book_copies_BranchID	book_copies_No_Of_Copies
1	1	1	5
2	2	1	5
3	3	1	5
4	4	1	5
5	5	1	5
6	6	1	5
7	7	1	5
8	8	1	5

## Table Borrower

```

222 create table tbl_borrower(
223     borrower_CardNo int primary key,
224     borrower_BorrowerName varchar(100),
225     borrower_BorrowerAddress varchar(200),
226     borrower_BorrowerPhone varchar(50))
227
228 insert into tbl_borrower
229 values
230     (100, 'Joe Smith', '1321 4th Street, New York, NY 10014', '212-312-1234'),
231     (101, 'Jane Smith', '1321 4th Street, New York, NY 10014', '212-931-4124'),
232     (102, 'Tom Li', '981 Main Street, Ann Arbor, MI 48104', '734-902-7455'),
233     (103, 'Angela Thompson', '2212 Green Avenue, Ann Arbor, MI 48104', '313-591-2122'),
234     (104, 'Harry Emnace', '121 Park Drive, Ann Arbor, MI 48104', '412-512-5522'),
235     (105, 'Tom Haverford', '23 75th Street, New York, NY 10014', '212-631-3418'),
236     (106, 'Haley Jackson', '231 52nd Avenue New York, NY 10014', '212-419-9935'),
237     (107, 'Michael Horford', '653 Glen Avenue, Ann Arbor, MI 48104', '734-998-1513')
238
239 select * from tbl_borrower

```

10 %

Results Messages

	borrower_CardNo	borrower_BorrowerName	borrower_BorrowerAddress	borrower_BorrowerPhone
1	100	Joe Smith	1321 4th Street, New York, NY 10014	212-312-1234
2	101	Jane Smith	1321 4th Street, New York, NY 10014	212-931-4124
3	102	Tom Li	981 Main Street, Ann Arbor, MI 48104	734-902-7455
4	103	Angela Thompson	2212 Green Avenue, Ann Arbor, MI 48104	313-591-2122
5	104	Harry Emnace	121 Park Drive, Ann Arbor, MI 48104	412-512-5522
6	105	Tom Haverford	23 75th Street, New York, NY 10014	212-631-3418
7	106	Haley Jackson	231 52nd Avenue New York, NY 10014	212-419-9935
8	107	Michael Horford	653 Glen Avenue, Ann Arbor, MI 48104	734-998-1513

## Table Book Loans

```

242 create table tbl_book_loans(
243     book_loans_LoansID int primary key,
244     book_loans_BookID int constraint FK5 foreign key references tbl_book(book_BookID),
245     book_loans_BranchID int constraint FK6 foreign key references tbl_library_branch(library_branch_BranchID),
246     book_loans_CardNo int constraint FK7 foreign key references tbl_borrower(borrower_CardNo),
247     book_loans_DateOut date,
248     book_loans_DueDate date)
249
250 insert into tbl_book_loans (book_loans_LoansID, book_loans_BookID, book_loans_BranchID,
251     book_loans_CardNo, book_loans_DateOut, book_loans_DueDate)
252 values
253     (1, '1', '1', '100', '1/1/18', '2/2/18'),
254     (2, '2', '1', '100', '1/1/18', '2/2/18'),
255     (3, '3', '1', '100', '1/1/18', '2/2/18'),
256     (4, '4', '1', '100', '1/1/18', '2/2/18'),
257     (5, '5', '1', '102', '1/3/18', '2/3/18'),
258     (6, '6', '1', '102', '1/3/18', '2/3/18'),
259     (7, '7', '1', '102', '1/3/18', '2/3/18'),

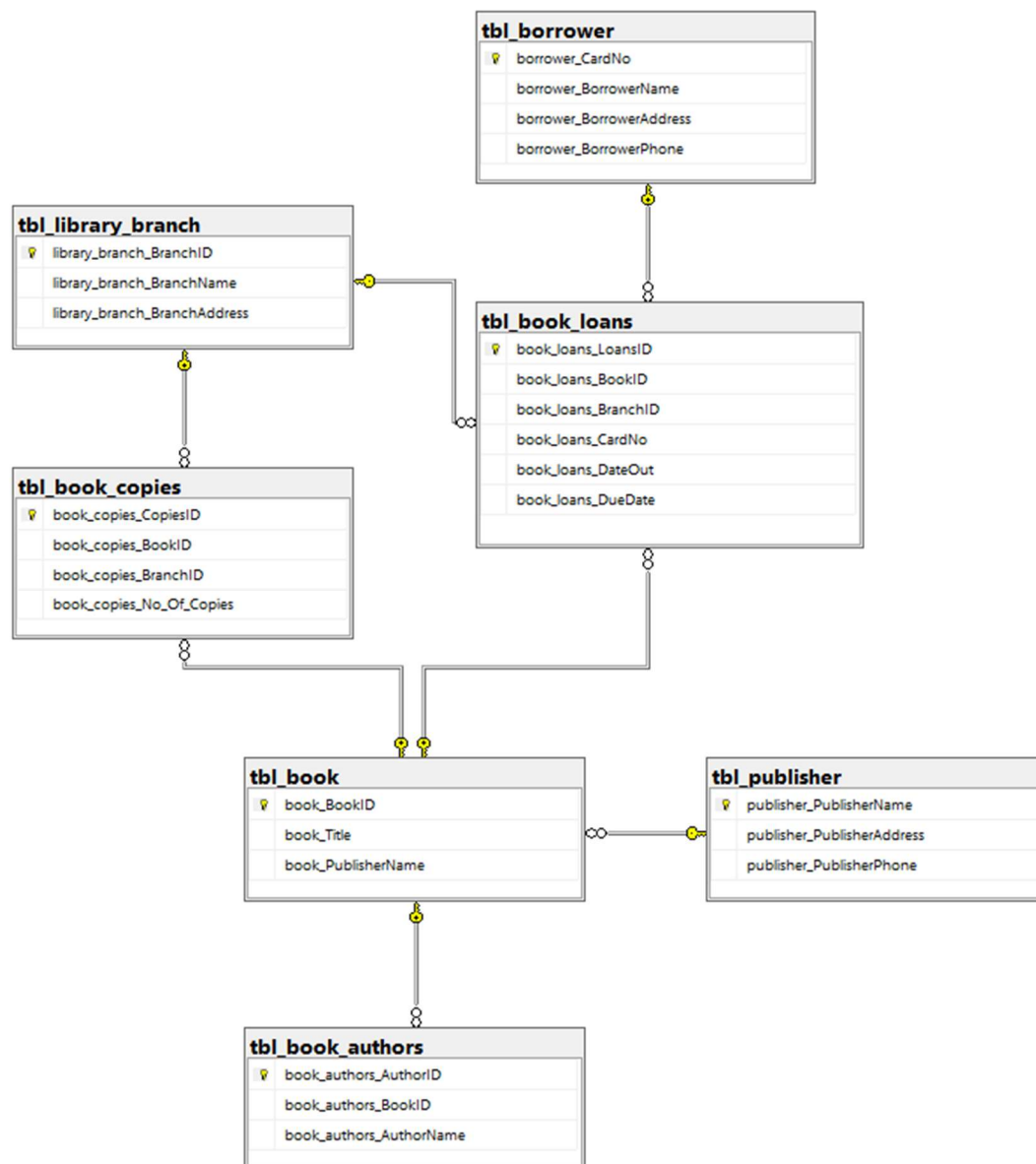
```

110 %

Results Messages

	book_loans_LoansID	book_loans_BookID	book_loans_BranchID	book_loans_CardNo	book_loans_DateOut	book_loans_DueDate
1	1	1	1	100	2018-01-01	2018-02-02
2	2	2	1	100	2018-01-01	2018-02-02
3	3	3	1	100	2018-01-01	2018-02-02
4	4	4	1	100	2018-01-01	2018-02-02
5	5	5	1	102	2018-01-03	2018-02-03
6	6	6	1	102	2018-01-03	2018-02-03
7	7	7	1	102	2018-01-03	2018-02-03
8	8	8	1	102	2018-01-03	2018-02-03
9	9	9	1	102	2018-01-03	2018-02-03
10	10	11	1	102	2018-01-03	2018-02-03
11	11	12	2	105	2017-12-12	2018-01-12
12	12	10	2	105	2017-12-12	2017-01-12
13	13	20	2	105	2018-02-03	2018-03-03

## Data Base Diagram





## Questions

1. Find the titles of all books published by "Bloomsbury."

```
314 select *
315 from tbl_book
316 where book_PublisherName = 'Bloomsbury'
```

110 %

	book_BookID	book_Title	book_PublisherName
1	8	Harry Potter and the Philosophers Stone	Bloomsbury
2	16	Harry Potter and the Chamber of Secrets	Bloomsbury
3	17	Harry Potter and the Prisoner of Azkaban	Bloomsbury

2. List the names of borrowers whose phone numbers start with the area code "212."

```
320 select borrower_BorrowerName
321 from tbl_borrower
322 where borrower_BorrowerPhone like '212%'
323
```

0 %

borrower_BorrowerName
Joe Smith
Jane Smith
Tom Haverford
Haley Jackson

3. Retrieve the titles of books with more than 10 copies available.

```
326 select book_Title, book_copies_No_Of_Copies
327 from tbl_book
328 join tbl_book_copies
329 on book_BookID = book_copies_BookID
330 where book_copies_No_Of_Copies > 10
331
```

0 %

book_Title	book_copies_No_Of_Copies
------------	--------------------------

#### 4. Display the names of borrowers who have borrowed books from the "Central" branch.

```
332  /*Q4.  Display the names of borrowers who have borrowed books from the "Central" branch.*/
333
334  select distinct borrower_BorrowerName
335  from tbl_borrower
336  join tbl_book_loans
337  on borrower_CardNo = book_loans_CardNo
338  join tbl_library_branch
339  on book_loans_BranchID = library_branch_BranchID
340  where library_branch_BranchName = 'Central'
```

results Messages

borrower_BorrowerName
Haley Jackson
Joe Smith
Tom Haverford

#### 5. List the titles of books borrowed by borrower "Joe Smith."

```
342  /*Q5.  List the titles of books borrowed by borrower "Joe Smith."*/
343
344  select book_Title
345  from tbl_book
346  join tbl_book_loans
347  on book_BookID = book_loans_BookID
348  join tbl_borrower
349  on book_loans_CardNo = borrower_CardNo
350  where borrower_BorrowerName = 'Joe Smith'
```

% Results Messages

book_Title
The Name of the Wind
It
The Green Mile
Dune
A Game of Thrones
It
The Green Mile

**6. Find the names of publishers for the books authored by "J.K. Rowling."**

```
352  /*Q6.  Find the names of publishers for the books authored by "J.K. Rowling."*/
353
354  =select book_PublisherName
355  from tbl_book
356  join tbl_book_authors
357  on book_BookID = book_authors_BookID
358  where book_authors_AuthorName = 'J.K. Rowling'
```

110 %

Results Messages

	book_PublisherName
1	Bloomsbury
2	Bloomsbury
3	Bloomsbury

**7. Count the total number of books available in the library.**

```
370
371  /*Q7.  Count the total number of books available in the library.*/
372
373  =SELECT SUM(book_copies_No_Of_Copies) AS total_books
374  FROM tbl_book_copies;
```

%

Results Messages

total_books
435



## 8. Calculate the average number of copies available per book across all branches.

```
364  /*Q8. Calculate the average number of copies available per book across all branches.*/
365
366  select book_Title, avg(book_copies_No_Of_Copies) as Avg_Copies_per_Book
367  from tbl_book_copies
368  join tbl_book
369  on book_copies_BookID = book_BookID
370  group by book_Title
371
```

10 %

	book_Title	Avg_Copies_per_Book
1	A Game of Thrones	5
2	A Wise Mans Fear	5
3	Brave New World	5
4	Dune	5
5	Eragon	5
5	Fight Club	5
7	Hard Boiled Wonderland and The End of the World	5
8	Harry Potter and the Chamber of Secrets	5
9	Harry Potter and the Philosophers Stone	5
10	Harry Potter and the Prisoner of Azkaban	5
11	Holes	5
12	It	5
13	The Fellowship of the Ring	5
14	The Giving Tree	5
15	The Green Mile	5
16	The Hitchhikers Guide to the Galaxy	5
17	The Hobbit	5
18	The Lost Tribe	5
19	The Name of the Wind	5
20	The Princess Bride	5

## 9. Find the branch with the highest number of books loaned out.

```
372  /*Q9. Find the branch with the highest number of books loaned out.*/
373
374  select top 1 library_branch_BranchName, count(book_loans_BookID) as No_Of_Books_Loaned
375  from tbl_book_loans
376  join tbl_library_branch
377  on book_loans_BranchID = library_branch_BranchID
378  group by library_branch_BranchName
379  order by No_Of_Books_Loaned desc
380
```

0 %

library_branch_BranchName	No_Of_Books_Loaned
Ann Arbor	20

## 10. Insert a new book titled "The Catcher in the Rye" by "J.D. Salinger" into the database.

```
393  /*Q10. Insert a new book titled "The Catcher in the Rye" by "J.D. Salinger" into the database.*/
394
395  insert into tbl_book (book_BookID, book_Title)
396  values (21, 'The Catcher in the Rye')
397
398  insert into tbl_book_authors
399  values (21, 21, 'J.D. Salinger')
```

110 %

Messages

(1 row affected)

(1 row affected)

Completion time: 2024-05-12T11:17:56.4808480-04:00

## Checking the table

```
400
401  /* Checking the tables after insertion*/
402
403  SELECT *
404  FROM tbl_book
405  WHERE book_BookID = 21;
406
407  Select *
408  from tbl_book_authors
409  where book_authors_BookID = 21;
```

110 %

Results Messages

	book_BookID	book_Title	book_PublisherName
1	21	The Catcher in the Rye	NULL

	book_authors_AuthorID	book_authors_BookID	book_authors_AuthorName
1	21	21	J.D. Salinger

## 11. Update the address of the "Sharpstown" library branch to "45 West Side Avenue, New York, NY 10012."

```
390  /*11.  Update the address of the "Sharpstown" library branch to "45 West Side Avenue, New York, NY 10012."*/
391
392  update tbl_library_branch
393  set library_branch_BranchAddress = '45 West Side Avenue, New York, NY 10012'
394  where library_branch_BranchName = 'Sharpstown'
395
```

0 %

Messages

(1 row affected)

Completion time: 2024-05-12T00:35:39.5429404-04:00

```
419  /*Checking the table after updation*/
420
421  select * from tbl_library_branch
422
```

110 %

Results Messages

	library_branch_BranchID	library_branch_BranchName	library_branch_BranchAddress
1	1	Sharpstown	45 West Side Avenue, New York, NY 10012
2	2	Central	491 3rd Street, New York, NY 10014
3	3	Saline	40 State Street, Saline, MI 48176
4	4	Ann Arbor	101 South University, Ann Arbor, MI 48104

## 12. Remove all books published by "Pan Books" from the database.

```
327
328  /*Q12.  Remove all books published by "Pan Books" from the database.*/
329
330  /*A conflict between the DELETE operation and the REFERENCE constraint was shown by the error message that the delete command
331  displayed.Cascade option is therefore added to the foreign key constraints.In SQL Server, you must first drop the current
332  foreign key constraint and then recreate it with the CASCADE option in order to add the CASCADE option. A foreign key
333  constraint cannot have the CASCADE option added or removed explicitly.*/
334
335  alter table tbl_book_authors
336  drop constraint FK2
337
338  alter table tbl_book_authors
339  add constraint FK2
340  foreign key (book_authors_BookID)
341  references tbl_book(book_BookID)
342  on delete cascade
343
344  alter table tbl_book_copies
345  drop constraint FK3
346
347  alter table tbl_book_copies
348  add constraint FK3
349  foreign key (book_copies_BookID)
350  references tbl_book(book_BookID)
351  on delete cascade
352
```

```
353 alter table tbl_book_loans
354 drop constraint FK5
355
356 alter table tbl_book_loans
357 add constraint FK5
358 foreign key (book_loans_BookID)
359 references tbl_book(book_BookID)
360 on delete cascade
361
362 delete from tbl_book
363 where book_PublisherName = 'Pan Books'
364
```

0 %

Messages

(1 row affected)

Completion time: 2024-05-12T00:51:28.1800580-04:00

### Checking the result after deletion

```
459
460 /*Check the result*/
461
462 select * from tbl_book
```

110 %

Results Messages

	book_BookID	book_Title	book_PublisherName
1	1	The Name of the Wind	DAW Books
2	2	It	Viking
3	3	The Green Mile	Signet Books
4	4	Dune	Chilton Books
5	5	The Hobbit	George Allen & Unwin
6	6	Eragon	Alfred A. Knopf
7	7	A Wise Mans Fear	DAW Books
8	8	Harry Potter and the Philosophers Stone	Bloomsbury
9	9	Hard Boiled Wonderland and The End of the World	Shinchosa
10	10	The Giving Tree	Harper and Row
11	11	The Hitchhikers Guide to the Galaxy	Pan Books
12	12	Brave New World	Chalto & Windus
13	13	The Princess Bride	Harcourt Brace Jova...
14	14	Fight Club	W.W. Norton
15	15	Holes	Scholastic
16	16	Harry Potter and the Chamber of Secrets	Bloomsbury
17	17	Harry Potter and the Prisoner of Azkaban	Bloomsbury
18	18	The Fellowship of the Ring	George Allen & Unwin
19	19	A Game of Thrones	Bantam
20	20	The Lost Tribe	Picador USA
21	21	The Catcher in the Rye	NULL

13. Retrieve the names of borrowers who have borrowed the same book more than once.

```

447  /*Q13. Retrieve the names of borrowers who have borrowed the same book more than once.*/
448
449  SELECT borrower_BorrowerName FROM tbl_borrower WHERE borrower_CardNo IN (SELECT
450  book_loans_CardNo FROM tbl_book_loans GROUP BY book_loans_CardNo HAVING
451  COUNT(book_loans_LoansID) > 1);

```

110 %

Results Messages

	borrower_BorrowerName
1	Joe Smith
2	Tom Li
3	Angela Thompson
4	Harry Emnace
5	Tom Haverford
6	Michael Horford

14. Find the title of the book with the earliest due date.

```

376  /*Q14. Find the title of the book with the earliest due date.*/
377
378  select book_Title [Book with earliest due date]
379  from tbl_book_loans
380  join tbl_book
381  on book_loans_BookID = book_BookID
382  where book_loans_DueDate = (select min(book_loans_DueDate) from tbl_book_loans)
383

```

0 %

Results Messages

Book with earliest due date
The Giving Tree

15. List the names of borrowers who have borrowed books authored by both "Stephen King" and "J.K. Rowling."

```

384
385  /*Q15. List the names of borrowers who have borrowed books authored by both "Stephen King" and "J.K. Rowling."*/
386
387  select distinct borrower_BorrowerName
388  from tbl_borrower
389  join tbl_book_loans
390  on borrower_CardNo = book_loans_CardNo
391  join tbl_book
392  on book_loans_BookID = book_BookID
393  join tbl_book_authors
394  on book_BookID = book_authors_BookID
395  where book_authors_AuthorName = 'Stephen King' and book_authors_AuthorName = 'J.K. Rowling'
396

```

0 %

Results Messages

borrower_BorrowerName
-----------------------



16. Find the names of borrowers who have borrowed books published by "Bloomsbury."

```

398  /*Q16. Find the names of borrowers who have borrowed books published by "Bloomsbury."/
399
400  select distinct borrower_BorrowerName
401  from tbl_borrower
402  join tbl_book_loans
403  on borrower_CardNo = book_loans_CardNo
404  join tbl_book
405  on book_loans_BookID = book_BookID
406  where book_PublisherName = 'Bloomsbury'

```

Results Messages

borrower_BorrowerName
Harry Emnace
Tom Li

17. Retrieve the titles of books borrowed by borrowers located in New York.

```

408  /*Q17. Retrieve the titles of books borrowed by borrowers located in New York.*/
409
410  select distinct book_Title [Books borrowed by borrowers in New York], borrower_BorrowerName
411  from tbl_book
412  join tbl_book_loans
413  on book_BookID = book_loans_BookID
414  join tbl_borrower
415  on book_loans_CardNo = borrower_CardNo
416  where borrower_BorrowerAddress like '%New York%'
417
418

```

Results Messages

	Books borrowed by borrowers in New York	borrower_BorrowerName
1	A Game of Thrones	Joe Smith
2	A Game of Thrones	Tom Haverford
3	Brave New World	Tom Haverford
4	Dune	Joe Smith
5	It	Joe Smith
6	The Fellowship of the Ring	Tom Haverford
7	The Giving Tree	Tom Haverford
8	The Green Mile	Joe Smith
9	The Hobbit	Tom Haverford
10	The Lost Tribe	Tom Haverford
11	The Name of the Wind	Haley Jackson
12	The Name of the Wind	Joe Smith

18. Calculate the average number of books borrowed per borrower.

```

418  /*Q18. Calculate the average number of books borrowed per borrower.*/
419
420
421  select count(*) / (select count(distinct book_loans_CardNo) from tbl_book_loans) as AvgNo_of_books_borrowed_per_borrower
422  from tbl_book_loans

```

Results Messages

AvgNo_of_books_borrowed_per_borrower
6

## 19. Find the branch with the highest average number of books borrowed per borrower.

```
424 /*Q19. Find the branch with the highest average number of books borrowed per borrower.*/
425
426
427 select top 1 book_loans_BranchID, count(*) / (select count(distinct book_loans_CardNo) from tbl_book_loans) as avg_books_borrowed_per_borrower
428 from tbl_book_loans
429 group by book_loans_BranchID
430 order by avg_books_borrowed_per_borrower desc
431
```

book_loans_BranchID	avg_books_borrowed_per_borrower
4	2

## 20. Rank library branches based on the total number of books borrowed, without grouping

```
509 /*Q20. Rank library branches based on the total number of books borrowed, without grouping*/
510
511 SELECT tbl_library_branch.library_branch_BranchName,
512 (
513 SELECT COUNT(*)
514 FROM tbl_book_loans
515 WHERE tbl_book_loans.book_loans_BranchID = tbl_library_branch.library_branch_BranchID
516 ) AS total_books_borrowed,
517 ROW_NUMBER() OVER (ORDER BY (
518 SELECT COUNT(*)
519 FROM tbl_book_loans
520 WHERE tbl_book_loans.book_loans_BranchID = tbl_library_branch.library_branch_BranchID
521 ) DESC) AS library_ranking
522 FROM tbl_library_branch;
523
```

library_branch_BranchName	total_books_borrowed	library_ranking
Ann Arbor	18	1
Central	10	2
Saline	10	3
Sharpstown	9	4

## 21. Calculate the percentage of books borrowed from each branch relative to the total number of books borrowed across all branches.

```
527
528 /*Q21. Calculate the percentage of books borrowed from each branch relative to the total number of books borrowed across all branches.*/
529
530 select
531 library_branch_BranchName,
532 count(book_loans_LoansID) as total_books_borrowed,
533 (count(book_loans_LoansID)*100/sum(count(book_loans_LoansID)) over()) as percent_books_loanedout
534 from tbl_library_branch join tbl_book_loans
535 on library_branch_BranchID = book_loans_BranchID
536 group by library_branch_BranchName
```

library_branch_BranchName	total_books_borrowed	percent_books_loanedout
Ann Arbor	18	38
Central	10	21
Saline	10	21
Sharpstown	9	19

**22. Find the names of borrowers who have borrowed books authored by "Stephen King" and "J.K. Rowling" from the same library branch.**

```

538
539 /*Q22. Find the names of borrowers who have borrowed books authored by "Stephen King" and "J.K. Rowling" from the same library branch.*/
540
541 select book_loans_BranchID, borrower_BorrowerName
542 from tbl_borrower
543 join tbl_book_loans
544 on borrower_CardNo = book_loans_CardNo
545 where book_loans_BookID in (
546     select book_authors_BookID from tbl_book_authors where book_authors_AuthorName in ('Stephen King', 'J.K. Rowling')
547 )
548

```

0 %

Results Messages

book_loans_BranchID	borrower_BorrowerName
1	Joe Smith
1	Joe Smith
1	Tom Li
2	Joe Smith
2	Joe Smith
3	Tom Li
3	Harry Emnace
4	Michael Horford
4	Michael Horford

**23. Retrieve the names of borrowers who have borrowed books from branches located in New York and have more than 5 books checked out.**

```

549 /*Q23. Retrieve the names of borrowers who have borrowed books from branches located in New York and have more than 5 books checked out.*/
550
551 select distinct borrower_BorrowerName, count(book_loans_BookID) as Books_ckecked_out
552 from tbl_borrower
553 join tbl_book_loans
554 on borrower_CardNo = book_loans_CardNo
555 join tbl_library_branch
556 on book_loans_BranchID = library_branch_BranchID
557 where library_branch_BranchAddress like '%New York%'
558 group by borrower_BorrowerName
559 having count(book_loans_BookID) > 5
560

```

0 %

Results Messages

borrower_BorrowerName	Books_ckecked_out
Joe Smith	7
Tom Haverford	6

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

```

562 /*Q24. How many copies of the book titled "The Lost Tribe" are owned by the library branch whose name is "Sharpstown"?*/
563
564 select library_branch_BranchName, book_Title, book_copies_No_Of_Copies
565 from tbl_book_copies
566 join tbl_book
567 on book_copies_BookID = book_BookID
568 join tbl_library_branch
569 on book_copies_BranchID = library_branch_BranchID
570 where book_Title = 'The Lost Tribe' and library_branch_BranchName = 'Sharpstown'
571

```

0 %

Results Messages

library_branch_BranchName	book_Title	book_copies_No_Of_Copies
Sharpstown	The Lost Tribe	5

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

```
573  /*Q25. How many copies of the book titled "The Lost Tribe" are owned by each library branch?*/
574
575  select library_branch_BranchName, book_Title, book_copies_No_Of_Copies
576  from tbl_book_copies
577  join tbl_book
578  on book_copies_BookID = book_BookID
579  join tbl_library_branch
580  on book_copies_BranchID = library_branch_BranchID
581  where book_Title = 'The Lost Tribe'
```

0 %

Results Messages

library_branch_BranchName	book_Title	book_copies_No_Of_Copies
Sharpstown	The Lost Tribe	5
Central	The Lost Tribe	5
Saline	The Lost Tribe	5
Ann Arbor	The Lost Tribe	5

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

```
583  /*Q26. Retrieve the names of all borrowers who do not have any books checked out.*/
584
585  select borrower_BorrowerName
586  from tbl_borrower
587  left join tbl_book_loans
588  on borrower_CardNo = book_loans_CardNo
589  where book_loans_CardNo is null
590
```

0 %

Results Messages

borrower_BorrowerName
Jane Smith

**27. 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.**

```

591 /*Q27. For each book that is loaned out from the "Sharpstown" branch and whose DueDate is today,
592 retrieve the book title, the borrower's name, and the borrower's address. */
593
594 SELECT tbl_book.book_Title, tbl_borrower.borrower_BorrowerName,
595        tbl_borrower.borrower_BorrowerAddress FROM tbl_book_loans
596 JOIN tbl_book ON tbl_book_loans.book_loans_BookID = tbl_book.book_BookID
597 JOIN tbl_borrower ON tbl_book_loans.book_loans_CardNo =
598        tbl_borrower.borrower_CardNo
599 JOIN tbl_library_branch ON tbl_book_loans.book_loans_BranchID =
600        tbl_library_branch.library_branch_BranchID
601 WHERE tbl_library_branch.library_branch_BranchName = 'Sharpstown' AND
602        tbl_book_loans.book_loans_DueDate = '2/2/18';
603
604

```

Results Messages

book_Title	borrower_BorrowerName	borrower_BorrowerAddress
The Name of the Wind	Joe Smith	1321 4th Street, New York, NY 10014
It	Joe Smith	1321 4th Street, New York, NY 10014
The Green Mile	Joe Smith	1321 4th Street, New York, NY 10014
Dune	Joe Smith	1321 4th Street, New York, NY 10014

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

```

606 /*Q28. For each library branch, retrieve the branch name and the total number of books loaned out from that branch.*/
607
608 select library_branch_BranchName, count(book_loans_BranchID) as total_books_loanedout
609 from tbl_library_branch
610 join tbl_book_loans
611 on library_branch_BranchID = book_loans_BranchID
612 group by library_branch_BranchName
613

```

Results Messages

library_branch_BranchName	total_books_loanedout
Ann Arbor	18
Central	10
Saline	10
Sharpstown	9

Thank You