

## TASK 02

### LIBRARY MANAGEMENT SYSTEM

*Create a database for managing a library's book inventory, members, and borrow/return transactions. This project helps you learn basic SQL commands and database design. Design tables for books, members, and transactions. Write SQL queries to insert, update, delete, and retrieve data.*

#### Retrieve all books available in the library

```
1 • create database library;
2 • use library;
3 • SELECT * FROM Books
4   WHERE Quantity > 0;
5
```

book_id	title	author	published_year	genre	quantity
1	Tough throw cause.	Duane Snow	2003	Fantasy	7
2	Mr main.	Belinda Beltran	1959	Mystery	6
3	Because hear leader.	Alejandra Hopkins	1949	Mystery	13
4	Since sound.	Douglas Huffman	1933	Sci-Fi	17
5	Notice open sea.	Rachel Butler	2002	Mystery	12
6	Clear truth.	Anthony Jefferson	1964	Non-fiction	14
7	Reduce interest.	Terry Knight	1914	Mystery	17
8	Bad throw.	Daniel Huff	1905	Fiction	2
9	Item great Congress.	Raven Rojas	1924	Fantasy	3
10	Show.	Richard Horne	1976	Fantasy	15
11	Pay anyone.	Hector Boyd	1949	Fantasy	18

## Find all transactions for a specific member

```
1 • create database library;
2 • use library;
3 • SELECT *
4   FROM Transactions
5  WHERE Member_ID = 3;
6
```

	book_id	member_id	borrow_date	return_date	status
▶	7	3	2023-12-29		Borrowed
	10	3	2023-11-07	2024-03-20	Returned
	9	3	2023-09-29	2024-04-16	Returned
	10	3	2023-11-22	2024-04-21	Returned
	1	3	2023-12-17		Borrowed
	2	3	2024-02-06		Borrowed
	6	3	2023-10-22	2024-04-03	Returned
	1	3	2023-12-27		Borrowed
	5	3	2024-08-03		Borrowed
	4	3	2023-10-01		Borrowed
	4	3	2023-12-17		Borrowed

## Retrieve the top 5 most borrowed books

```
2 • use library;
3 • SELECT Title, COUNT(*) AS BorrowCount
4   FROM Transactions
5  JOIN Books ON Transactions.Book_ID = Books.Book_ID
6  WHERE Status = 'Borrowed'
7  GROUP BY Title
8  ORDER BY BorrowCount DESC
9  LIMIT 5;
```

	Title	BorrowCount
▶	Tough throw cause.	7
	Since sound.	7
	Reduce interest.	7
	Because hear leader.	4
	Notice open sea.	4

## Find members who have borrowed books but have not returned them

```
1 • create database library;
2 • use library;
3 • SELECT DISTINCT CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name
4   FROM Transactions
5  JOIN Members ON Transactions.Member_ID = Members.Member_ID
6  JOIN Books  ON Transactions.Book_ID = Books.Book_ID
7  WHERE Transactions.Status = 'Borrowed';
8
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
Members_Name				
▶	Regina Jordan			
	Teresa Phelps			
	Mitchell Montes			
	Linda Peterson			
	Melissa Johnson			
	Linda Salas			
	Melanie Jones			
	Amanda Hanna			
	Jennifer Floyd			
	Danielle Graham			

## Count the number of books borrowed by each member

```
1 • create database library;
2 • use library;
3 • SELECT CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name,
4   COUNT(Transactions.Transaction_ID) AS TotalBorrows
5   FROM Members
6  JOIN Transactions ON Members.Member_ID = Transactions.Member_ID
7  WHERE Transactions.Status = 'returned'
8  GROUP BY Members.first_Name, Members.last_Name;
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
Members_Name		TotalBorrows		
▶	Regina Jordan	3		
	Teresa Phelps	7		
	Mitchell Montes	4		
	Linda Peterson	6		
	Melissa Johnson	4		
	Linda Salas	8		
	Melanie Jones	4		
	Amanda Hanna	4		
	Jennifer Floyd	5		
	Danielle Graham	5		

## List all overdue books (assuming books should be returned within 30 days)

```
2 • use library;
3 • SELECT Books.Title, CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name,
4     Transactions.Borrow_Date
5 FROM Transactions
6 JOIN Books ON Transactions.Book_ID = Books.Book_ID
7 JOIN Members ON Transactions.Member_ID = Members.Member_ID
8 WHERE Transactions.Status = 'Borrowed'
9 AND DATEDIFF(CURDATE(), Transactions.Borrow_Date) > 30;
```

Title	Members_Name	Borrow_Date
Show.	Regina Jordan	2024-05-18
Reduce interest.	Regina Jordan	2024-03-07
Notice open sea.	Regina Jordan	2024-04-12
Mr main.	Regina Jordan	2024-07-21
Clear truth.	Teresa Phelps	2024-01-29
Since sound.	Teresa Phelps	2024-03-20
Since sound.	Teresa Phelps	2024-01-11
Mr main.	Teresa Phelps	2024-01-06
Mr main.	Teresa Phelps	2024-04-27
Item great Congress.	Mitchell Montes	2024-02-17
Reduce interest.	Mitchell Montes	2023-12-10
Clear truth.	Mitchell Montes	2023-12-29
Bad throw.	Linda Peterson	2024-05-15

## Retrieve books borrowed within the last month

```
2 • use library;
3 • SELECT Books.Title, CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name,
4     Transactions.Borrow_Date
5 FROM Transactions
6 JOIN Books ON Transactions.Book_ID = Books.Book_ID
7 JOIN Members ON Transactions.Member_ID = Members.Member_ID
8 WHERE Transactions.Borrow_Date >= CURDATE() - INTERVAL 1 MONTH;
```

Title	Members_Name	Borrow_Date
Since sound.	Regina Jordan	2024-08-22
Tough throw cause.	Regina Jordan	2024-08-28
Because hear leader.	Teresa Phelps	2024-08-07
Tough throw cause.	Linda Peterson	2024-08-13
Reduce interest.	Melissa Johnson	2024-08-25
Item great Congress.	Melissa Johnson	2024-08-10
Bad throw.	Linda Salas	2024-08-26
Because hear leader.	Linda Salas	2024-08-31
Because hear leader.	Melanie Jones	2024-08-22
Show.	Melanie Jones	2024-08-28
Clear truth.	Melanie Jones	2024-08-27
Clear truth.	Amanda Hanna	2024-08-29
Mr main.	Jennifer Floyd	2024-08-18

## Find the most active members based on borrow transactions

```
2 • use library;
3 • SELECT CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name,
4   COUNT(*) AS ActivityCount
5   FROM Members
6  JOIN Transactions ON Members.Member_ID = Transactions.Member_ID
7  GROUP BY Members.first_Name, Members.last_Name
8  ORDER BY ActivityCount DESC
9  LIMIT 5;
10
```

Members_Name	ActivityCount
Linda Salas	16
Linda Peterson	14
Teresa Phelps	12
Melanie Jones	11
Regina Jordan	9

## Retrieve book availability status along with the count of current borrows

```
2 • use library;
3 • SELECT Books.Title, Books.Quantity,
4   (SELECT COUNT(*) FROM Transactions WHERE Transactions.Book_ID = Books.Book_ID AND Status = 'Borrowed') AS CurrentBorrows
5   FROM Books;
6
7
```

Title	Quantity	CurrentBorrows
Tough throw cause.	7	2
Mr main.	6	4
Because hear leader.	13	5
Since sound.	17	6
Notice open sea.	12	6
Clear truth.	14	10
Reduce interest.	17	7
Bad throw.	2	4
Item great Congress.	3	3
Show.	15	3
Pay anyone.	18	0
Any collection.	19	0
Rather run.	15	0
Collection.	10	0
Author skill project.	13	0

## List all members and the total number of books they have borrowed and returned

```
2 • use library;
3 • SELECT CONCAT(Members.first_Name, ' ', Members.last_Name) AS Members_Name,
4     SUM(CASE WHEN Transactions.Status = 'Borrowed' THEN 1 ELSE 0 END) AS TotalBorrowed,
5     SUM(CASE WHEN Transactions.Status = 'Returned' THEN 1 ELSE 0 END) AS TotalReturned
6 FROM Members
7 LEFT JOIN Transactions ON Members.Member_ID = Transactions.Member_ID
8 GROUP BY Members.first_Name, Members.last_Name;
```

Members_Name	TotalBorrowed	TotalReturned
Regina Jordan	6	3
Teresa Phelps	5	7
Mitchell Montes	3	4
Linda Peterson	8	6
Melissa Johnson	4	4
Linda Salas	8	8
Melanie Jones	7	4
Amanda Hanna	2	4
Jennifer Floyd	3	5
Danielle Graham	4	5

## Identify books that have never been borrowed

```
2 • use library;
3 • SELECT Books.Title
4 FROM Books
5 LEFT JOIN Transactions ON Books.Book_ID = Transactions.Book_ID
6 WHERE Transactions.Book_ID IS NULL;
7
8
```

Title
Pay anyone.
Any collection.
Rather run.
Collection.
Author skill project.

