

## Project : Library Management System

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Create a database named library and following TABLES in the database:

1. Branch
2. Employee
3. Books
4. Customer
5. IssueStatus
6. ReturnStatus

Attributes for the tables:

1. Branch

- Branch\_no - Set as PRIMARY KEY
- Manager\_Id
- Branch\_address
- Contact\_no

```
1 • CREATE DATABASE library;
2 • USE library;
3
4 • CREATE TABLE Branch (
5     Branch_no INT AUTO_INCREMENT PRIMARY KEY,
6     Manager_Id INT NOT NULL,
7     Branch_address VARCHAR(255) NOT NULL,
8     Contact_no VARCHAR(20) NOT NULL
9 );
10
11 • DESC Branch;
12
```

Field	Type	Null	Key	Default	Extra
Branch_no	int	NO	PRI	NULL	auto_increment
Manager_Id	int	NO		NULL	
Branch_address	varchar(255)	NO		NULL	
Contact_no	varchar(20)	NO		NULL	

## 2. Employee

- Emp\_Id – Set as PRIMARY KEY
- Emp\_name
- Position
- Salary
- Branch\_no - Set as FOREIGN KEY and it refer Branch\_no in Branch table

```
13 • CREATE TABLE Employee (  
14     Emp_Id INT AUTO_INCREMENT PRIMARY KEY,  
15     Emp_name VARCHAR(100) NOT NULL,  
16     Position VARCHAR(100) NOT NULL,  
17     Salary DECIMAL(10, 2) NOT NULL,  
18     Branch_no INT,  
19     FOREIGN KEY (Branch_no) REFERENCES Branch(Branch_no)  
20 );  
21  
22 • DESC Employee;
```

Field	Type	Null	Key	Default	Extra
Emp_Id	int	NO	PRI	<div>NULL</div>	auto_increment
Emp_name	varchar(100)	NO		<div>NULL</div>	
Position	varchar(100)	NO		<div>NULL</div>	
Salary	decimal(10,2)	NO		<div>NULL</div>	
Branch_no	int	YES	MUL	<div>NULL</div>	

## 3. Books

- ISBN - Set as PRIMARY KEY
- Book\_title
- Category
- Rental\_Price
- Status [Give yes if book available and no if book not available]
- Author
- Publisher

```
23  
24 • CREATE TABLE Books (  
25     ISBN VARCHAR(20) PRIMARY KEY,  
26     Book_title VARCHAR(255) NOT NULL,  
27     Category VARCHAR(100) NOT NULL,  
28     Rental_Price DECIMAL(10, 2) NOT NULL,  
29     Status ENUM('yes', 'no') NOT NULL,  
30     Author VARCHAR(100) NOT NULL,  
31     Publisher VARCHAR(100) NOT NULL  
32 );  
33  
34 • DESC Books;  
35  
36
```

Field	Type	Null	Key	Default	Extra
ISBN	varchar(20)	NO	PRI	<div>NULL</div>	
Book_title	varchar(255)	NO		<div>NULL</div>	
Category	varchar(100)	NO		<div>NULL</div>	
Rental_Price	decimal(10,2)	NO		<div>NULL</div>	
Status	enum('yes','no')	NO		<div>NULL</div>	
Author	varchar(100)	NO		<div>NULL</div>	
Publisher	varchar(100)	NO		<div>NULL</div>	

#### 4. Customer

- Customer\_Id - Set as PRIMARY KEY
- Customer\_name
- Customer\_address
- Reg\_date

```
36 • CREATE TABLE Customer (  
37     Customer_Id INT AUTO_INCREMENT PRIMARY KEY,  
38     Customer_name VARCHAR(100) NOT NULL,  
39     Customer_address VARCHAR(255) NOT NULL,  
40     Reg_date DATE NOT NULL  
41 );  
42 • DESC Customer;  
43  
44
```

Field	Type	Null	Key	Default	Extra
Customer_Id	int	NO	PRI	NULL	auto_increment
Customer_name	varchar(100)	NO		NULL	
Customer_address	varchar(255)	NO		NULL	
Reg_date	date	NO		NULL	

#### 5. IssueStatus

- Issue\_Id - Set as PRIMARY KEY
- Issued\_cust – Set as FOREIGN KEY and it refer customer\_id in CUSTOMER table
- Issued\_book\_name
- Issue\_date
- Isbn\_book – Set as FOREIGN KEY and it should refer isbn in BOOKS table

```
44 • CREATE TABLE IssueStatus (  
45     Issue_Id INT AUTO_INCREMENT PRIMARY KEY,  
46     Issued_cust INT,  
47     Issued_book_name VARCHAR(255) NOT NULL,  
48     Issue_date DATE NOT NULL,  
49     Isbn_book VARCHAR(20),  
50     FOREIGN KEY (Issued_cust) REFERENCES Customer(Customer_Id),  
51     FOREIGN KEY (Isbn_book) REFERENCES Books(ISBN)  
52 );  
53  
54 • DESC IssueStatus;  
55
```

Field	Type	Null	Key	Default	Extra
Issue_Id	int	NO	PRI	NULL	auto_increment
Issued_cust	int	YES	MUL	NULL	
Issued_book_name	varchar(255)	NO		NULL	
Issue_date	date	NO		NULL	
Isbn_book	varchar(20)	YES	MUL	NULL	

## 6. ReturnStatus

- Return\_Id - Set as PRIMARY KEY
- Return\_cust
- Return\_book\_name
- Return\_date
- Isbn\_book2 - Set as FOREIGN KEY and it should refer isbn in BOOKS table

```
--  
56 • CREATE TABLE ReturnStatus (  
57     Return_Id INT AUTO_INCREMENT PRIMARY KEY,  
58     Return_cust INT,  
59     Return_book_name VARCHAR(255) NOT NULL,  
60     Return_date DATE NOT NULL,  
61     Isbn_book2 VARCHAR(20),  
62     FOREIGN KEY (Isbn_book2) REFERENCES Books(ISBN)  
63 );  
64  
65 • DESC ReturnStatus;  
66
```

Field	Type	Null	Key	Default	Extra
Return_Id	int	NO	PRI	NULL	auto_increment
Return_cust	int	YES		NULL	
Return_book_name	varchar(255)	NO		NULL	
Return_date	date	NO		NULL	
Isbn_book2	varchar(20)	YES	MUL	NULL	

1. Retrieve the book title, category, and rental price of all available books.

```
76  
77 • SELECT Book_title, Category, Rental_Price  
78 FROM Books  
79 WHERE Status = 'yes';  
80
```

Book_title	Category	Rental_Price
Data Structures and Algorithms	Computer Science	19.99
Introduction to SQL	Programming	15.99

2. List the employee names and their respective salaries in descending order of salary.

```
104 • SELECT Emp_name, Salary
105 FROM Employee
106 ORDER BY Salary DESC;
```

Emp_name	Salary
George Washington	45000.00
Alice Johnson	40000.00
Diana Prince	35000.00
Charlie Brown	32000.00
Hannah Montana	31000.00
Bob Smith	30000.00
Fiona Shrek	29000.00
Edward Nygma	28000.00

3. Retrieve the book titles and the corresponding customers who have issued those books.

```
138 • SELECT
139     B.Book_title,
140     C.Customer_name
141 FROM
142     Books B
143 JOIN
144     IssueStatus I ON B.ISBN = I.Isbn_book
145 JOIN
146     Customer C ON I.Issued_cust = C.Customer_Id;
```

Book_title	Customer_name
History of the World	Michael Johnson
History of the World	Olivia Garcia
Data Structures and Algorithms	Jane Smith
Data Structures and Algorithms	William Brown
Data Structures and Algorithms	Sophia Martinez
Introduction to SQL	John Doe
Introduction to SQL	Emily Davis
Introduction to SQL	James Wilson

4. Display the total count of books in each category.

```
154
155 • SELECT Category, COUNT(*) AS Total_Books
156 FROM Books
157 GROUP BY Category;
```

Category	Total_Books
History	1
Computer Science	1
Programming	1

5. Retrieve the employee names and their positions for the employees whose salaries are above Rs.50,000.

```
169 • SELECT Emp_name, Position
170 FROM Employee
171 WHERE Salary > 50000;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Cont
Emp_name	Position		
Alice Johnson	Librarian		
George Washington	Reference Librarian		

6. List the customer names who registered before 2022-01-01 and have not issued any books yet.

```
189 • SELECT Customer.Customer_name
190 FROM Customer
191 LEFT JOIN IssueStatus ON Customer.Customer_Id = IssueStatus.Issued_cust
192 WHERE Customer.Reg_date < '2022-01-01' ;
193
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
Customer_name			
John Doe			
Jane Smith			
Michael Johnson			

7. Display the branch numbers and the total count of employees in each branch.

```
205 • SELECT Branch_no, COUNT(*) AS Total_Employees
206 FROM Employee
207 GROUP BY Branch_no;
208
```

Result Grid	Filter Rows:	Export:	Wrap Ce
Branch_no	Total_Employees		
1	2		
2	2		
3	2		
4	2		

8. Display the names of customers who have issued books in the month of June 2023.

```
211 • UPDATE IssueStatus
212     SET Issue_date = '2023-06-15'
213     WHERE Issue_Id = 1;
214
215 • UPDATE IssueStatus
216     SET Issue_date = '2023-06-20'
217     WHERE Issue_Id = 2;
218
219 • SELECT Customer.Customer_name
220     FROM Customer
221     JOIN IssueStatus ON Customer.Customer_Id = IssueStatus.Issued_cust
222     WHERE IssueStatus.Issue_date BETWEEN '2023-06-01' AND '2023-06-30';
223
224
225
```

Result Grid | | Filter Rows:  | Export: | Wrap Cell Content:

	Customer_name
▶	John Doe
	Jane Smith

9. Retrieve book\_title from book table containing history.

```
228 • SELECT book_title
229     FROM Books
230     WHERE book_title LIKE '%history%';
231
232
233
234
```

Result Grid | | Filter Rows:  | Export: | Wrap Cell Content:

	book_title
▶	History of the World

10. Retrieve the branch numbers along with the count of employees for branches having more than 5 employees

```
263 • SELECT Branch_no, COUNT(*) AS Total_Employees
264 FROM Employee
265 GROUP BY Branch_no
266 HAVING COUNT(*) > 1;
267
268
269
270
271
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
Branch_no	Total_Employees			
1	2			
2	7			
3	7			
4	2			

Result 45 x

11. Retrieve the names of employees who manage branches and their respective branch addresses.

```
279 • SELECT e.Emp_name AS Employee_Name, b.Branch_address AS Branch_Address
280 FROM Employee e
281 JOIN Branch b ON e.Branch_no = b.Branch_no
282 WHERE e.Position = 'Manager';
283
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
Employee_Name	Branch_Address			
Alice Johnson	123 Library St			
Bob Smith	123 Library St			
Charlie Brown	456 Book Ave			



12. Display the names of customers who have issued books with a rental price higher than Rs. 25.

```
302 • SELECT DISTINCT c.Customer_name
303 FROM Customer c
304 JOIN IssueStatus i ON c.Customer_Id = i.Issued_cust
305 JOIN Books b ON i.Isbn_book = b.ISBN
306 WHERE b.Rental_Price > 25;
307
308
309
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	Customer_name			
▶	Michael Johnson			
	Olivia Garcia			
	Jane Smith			
	William Brown			
	Sophia Martinez			
	John Doe			
	Emily Davis			
	James Wilson			