

Library Management System

The Library Management System is a database project designed to keep track of all information about books in a library, including their cost, status, and availability. It also manages information about library branches, employees, customers, book issues, and returns. This project is implemented using SQL, and it ensures efficient and organized management of library resources.

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

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

Creation of 'Library' Database.

```
1  ## Creation of 'Library' Database.  
2  
3 • CREATE DATABASE Library;  
4  
5 • USE Library;  
6
```

Attributes for the tables:

1. Branch

- Branch_no - Set as PRIMARY KEY
- Manager_Id
- Branch_address
- Contact_no

Creation of 'Branch' Table.

```
7  ## Creation of 'Branch' Table.
8
9  • CREATE TABLE Branch(
10      Branch_no INT PRIMARY KEY,
11      Manager_Id INT,
12      Branch_address VARCHAR(30),
13      Contact_no INT );
14
15 • DESC Branch;
```

Description of 'Branch' Table

Field	Type	Null	Key	Default	Extra
Branch_no	int	NO	PRI	NULL	
Manager_Id	int	YES		NULL	
Branch_address	varchar(30)	YES		NULL	
Contact_no	int	YES		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

Creation of 'Employee' Table.

```
17  ## Creation of 'Employee' Table.
18
19  • CREATE TABLE Employee(
20      Emp_Id INT PRIMARY KEY,
21      Emp_name VARCHAR(30),
22      Position VARCHAR(30),
23      Salary DECIMAL(10,2),
24      Branch_no INT,
25      FOREIGN KEY (Branch_no) REFERENCES Branch(Branch_no) );
26
27  • DESC Employee;
28
```

Description of 'Employee' Table.

Field	Type	Null	Key	Default	Extra
Emp_Id	int	NO	PRI	NULL	
Emp_name	varchar(30)	YES		NULL	
Position	varchar(30)	YES		NULL	
Salary	decimal(10,2)	YES		NULL	
Branch_no	int	YES	MUL	NULL	

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.

Creation of 'Books' Table.

```
31 • CREATE TABLE Books(  
32     ISBN INT(15) PRIMARY KEY,  
33     Book_title VARCHAR(50),  
34     Category VARCHAR(30),  
35     Rental_Price DECIMAL(10,2),  
36     Status ENUM('Yes','No'),  
37     Author VARCHAR(30),  
38     Publisher VARCHAR(30) );  
39  
40 • DESC Books;
```

Description of 'Books' Table.

Result Grid						
		Filter Rows:			Export:	Wrap Cell Content:
	Field	Type	Null	Key	Default	Extra
▶	isbn	int	NO	PRI	NULL	
	Book_title	varchar(50)	YES		NULL	
	Category	varchar(30)	YES		NULL	
	Rental_Price	decimal(10,2)	YES		NULL	
	Status	enum('Yes','No')	YES		NULL	
	Author	varchar(30)	YES		NULL	
	Publisher	varchar(30)	YES		NULL	

4. Customer

- Customer_Id - Set as PRIMARY KEY
- Customer_name
- Customer_address
- Reg_date

Creation of 'Customer' Table.

```
44 • CREATE TABLE Customer(  
45     Customer_Id INT PRIMARY KEY,  
46     Customer_name VARCHAR(30),  
47     Customer_address VARCHAR(50),  
48     Reg_date DATE );  
49  
50 • DESC Customer;  
51
```

Description of 'Customer' Table.

Result Grid						
		Filter Rows:			Export:	Wrap Cell Content:
	Field	Type	Null	Key	Default	Extra
►	Customer_Id	int	NO	PRI	NULL	
	Customer_name	varchar(30)	YES		NULL	
	Customer_address	varchar(50)	YES		NULL	
	Reg_date	date	YES		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

Creation of 'IssueStatus' Table

```
54 • CREATE TABLE IssueStatus(  
55     Issue_Id INT PRIMARY KEY,  
56     Issued_cust INT,  
57     Issued_book_name VARCHAR(50),  
58     Issue_date DATE,  
59     Isbn_book INT(15),  
60     FOREIGN KEY (Issued_cust) REFERENCES Customer(Customer_Id),  
61     FOREIGN KEY (Isbn_book) REFERENCES Books(ISBN) );  
62  
63 • DESC IssueStatus;
```

Description of 'IssueStatus' Table.

Field	Type	Null	Key	Default	Extra
Issue_Id	int	NO	PRI	NULL	
Issued_cust	int	YES	MUL	NULL	
Issued_book_name	varchar(50)	YES		NULL	
Issue_date	date	YES		NULL	
Isbn_book	int	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

Creation of 'ReturnStatus' Table

```
67 • CREATE TABLE ReturnStatus(  
68     Return_Id INT PRIMARY KEY,  
69     Return_cust INT,  
70     Return_book_name VARCHAR(50),  
71     Return_date DATE,  
72     Isbn_book2 INT(15),  
73     FOREIGN KEY (Return_cust) REFERENCES Customer(Customer_Id),  
74     FOREIGN KEY (Isbn_book2) REFERENCES Books(ISBN) );  
75  
76 • DESC ReturnStatus;
```

Description of 'ReturnStatus' Table.




Result Grid						
		Filter Rows:			Export:	Wrap Cell Content:
	Field	Type	Null	Key	Default	Extra
►	Return_Id	int	NO	PRI	NULL	
	Return_cust	int	YES	MUL	NULL	
	Return_book_name	varchar(50)	YES		NULL	
	Return_date	date	YES		NULL	
	Isbn_book2	int	YES	MUL	NULL	

Insertion of data into the table 'Branch'

```
80 • INSERT INTO Branch VALUES
81     (101,201,'Neeleshwaram,Kasaragod',986745123),
82     (102,202,'Thalassery,Kannur',854775892),
83     (103,203,'Kalpetta,Wayanad',720546182),
84     (104,204,'Mavoor,Kozhikode',653248791),
85     (105,205,'Manjeri,Malappuram',753248759),
86     (106,206,'Ottappalam,Palakkad',857945750),
87     (107,207,'Chalakkudi,Thrissur',949572461),
88     (108,208,'Kochi,Ernakulam',854766778),
89     (109,209,'Kattappana,Idukki',623500050),
90     (110,210,'Pala,Kottayam',894785623);
91
```

Display of 'Branch' Table

92 ## Display of 'Branch' Table

Result Grid				
Filter Rows: <input type="text"/>				
Edit:    Export				
	Branch_no	Manager_Id	Branch_address	Contact_no
▶	101	201	Neeleshwaram,Kasaragod	986745123
	102	202	Thalassery,Kannur	854775892
	103	203	Kalpetta,Wayanad	720546182
	104	204	Mavoor,Kozhikode	653248791
	105	205	Manjeri,Malappuram	753248759
	106	206	Ottappalam,Palakkad	857945750
	107	207	Chalakkudi,Thrissur	949572461
	108	208	Kochi,Ernakulam	854766778
	109	209	Kattappana,Idukki	623500050
	110	210	Pala,Kottayam	894785623
*	NULL	NULL	NULL	NULL

Insertion of data into the table 'Employee'.

116 • **INSERT INTO** Books **VALUES**

```
117     (978123486,'The Great Library Adventure','Fiction',20,'Yes','Jane Author','BookHouse Publishers'),
118     (978988554,'Mystery at Midnight Manor','Mystery',20,'Yes','Sam Sleuth','Enigma Press'),
119     (978543210,'Science Explorations','Science',30,'Yes','Lisa Scientist','Discovery Books'),
120     (978135792,'Historical Chronicles','History',28,'Yes','Henry Historian','Past Times Publishing'),
121     (978135124,'Poetry Anthology','Poetry',24,'Yes','Sam Sonnet','Verse Versatility'),
122     (978123456,'Fantasy Quest II','Fantasy',20,'No','Ella Enchantress','Mythical'),
123     (978987636,'Cooking Adventures','Cookbook',20,'Yes','Chef Culinary','Tasty Recipes'),
124     (978543211,'Historical Journeys','History',28,'Yes','Lucy Historian','Past Chronicles'),
125     (978981554,'Enigma Enigmas','Puzzles',20,'No','Riddle Solver','Brain Teasers Publishing'),
126     (978112233,'Classic Literature Classics','Literature',24,'Yes','William Wordsmith','Timeless Editions');
127
```

Display of 'Books' Table

130 • **SELECT * FROM** Books;





Result Grid		Filter Rows:		Edit:		Export/Import:		Wrap Cell Content:		Fetch rows:	
	isbn	Book_title	Category	Rental_Price	Status	Author	Publisher				
▶	978112233	Classic Literature Classics	Literature	24.00	Yes	William Wordsmith	Timeless Editions				
	978123456	Fantasy Quest II	Fantasy	20.00	No	Ella Enchantress	Mythical				
	978123486	The Great Library Adventure	Fiction	20.00	Yes	Jane Author	BookHouse Publishers				
	978135124	Poetry Anthology	Poetry	24.00	Yes	Sam Sonnet	Verse Versatility				
	978135792	Historical Chronicles	History	28.00	Yes	Henry Historian	Past Times Publishing				
	978543210	Science Explorations	Science	30.00	Yes	Lisa Scientist	Discovery Books				
	978543211	Historical Journeys	History	28.00	Yes	Lucy Historian	Past Chronicles				
	978981554	Enigma Enigmas	Puzzles	20.00	No	Riddle Solver	Brain Teasers Publishing				
	978987636	Cooking Adventures	Cookbook	20.00	Yes	Chef Culinary	Tasty Recipes				
	978988554	Mystery at Midnight Manor	Mystery	20.00	Yes	Sam Sleuth	Enigma Press				
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL				

Insertion of data into the table 'Customer'

```
134 • INSERT INTO Customer VALUES
135     (401,'Alex','Gandhinagar,Iritty','2023-05-10'),
136     (402,'Sumesh','Pattery,Mavoor','2022-06-24'),
137     (403,'Roshan','Maloor,Kannur','2020-08-30'),
138     (404,'Midhun','Thaliparamba,Payyannur','2021-01-26'),
139     (405,'Jishna','Kariyad,Mahe','2022-02-11'),
140     (406,'Rahul','Palavayal,Cherupuzha','2020-06-06'),
141     (407,'Hafiz','Kuttyadi,Perambra','2021-11-14'),
142     (408,'Vipin','Narikkuni,Balusseriy','2020-12-20'),
143     (409,'Navas','Payyoli,Koyilandi','2023-09-15'),
144     (410,'Saranya','Aluva,Perumbavoor','2024-02-10');
145
```

Display of 'Customer' Table

```
148 • SELECT * FROM Customer;
```

Result Grid				
Filter Rows: <input type="text"/>				
Edit:   				
Export/Import: 				
	Customer_Id	Customer_name	Customer_address	Reg_date
▶	401	Alex	Gandhinagar,Iritty	2023-05-10
	402	Sumesh	Pattery,Mavoor	2022-06-24
	403	Roshan	Maloor,Kannur	2020-08-30
	404	Midhun	Thaliparamba,Payyannur	2021-01-26
	405	Jishna	Kariyad,Mahe	2022-02-11
	406	Rahul	Palavayal,Cherupuzha	2020-06-06
	407	Hafiz	Kuttyadi,Perambra	2021-11-14
	408	Vipin	Narikkuni,Balusseriy	2020-12-20
	409	Navas	Payyoli,Koyilandi	2023-09-15
	410	Saranya	Aluva,Perumbavoor	2024-02-10
*	NULL	NULL	NULL	NULL

Insertion of data into the table 'Issuestatus'.

```
152 • INSERT INTO Issuestatus VALUES
153     (501,402,'Historical Chronicles','2023-06-15',978135792),
154     (502,407,'Classic Literature Classics','2023-12-28',978112233),
155     (503,404,'The Great Library Adventure','2024-02-13',978123486),
156     (504,401,'Cooking Adventures','2024-03-20',978987636),
157     (505,408,'Mystery at Midnight Manor','2024-04-10',978988554),
158     (506,409,'Classic Literature Classics','2023-06-06',978112233),
159     (507,406,'Science Explorations','2024-05-01',978543210),
160     (508,405,'Cooking Adventures','2024-03-09',978987636),
161     (509,404,'Poetry Anthology','2024-03-20',978135124),
162     (510,410,'Mystery at Midnight Manor','2024-05-10',978988554);
163
```

Display of 'Issuestatus' Table.

```
166 • SELECT * FROM Issuestatus;
```

Result Grid					
Filter Rows:					
Edit: Export/Import:					
	Issue_Id	Issued_cust	Issued_book_name	Issue_date	Isbn_book
▶	501	402	Historical Chronicles	2023-06-15	978135792
	502	407	Classic Literature Classics	2023-12-28	978112233
	503	404	The Great Library Adventure	2024-02-13	978123486
	504	401	Cooking Adventures	2024-03-20	978987636
	505	408	Mystery at Midnight Manor	2024-04-10	978988554
	506	409	Classic Literature Classics	2023-06-06	978112233
	507	406	Science Explorations	2024-05-01	978543210
	508	405	Cooking Adventures	2024-03-09	978987636
	509	404	Poetry Anthology	2024-03-20	978135124
	510	410	Mystery at Midnight Manor	2024-05-10	978988554
*	NULL	NULL	NULL	NULL	NULL

Insertion of data into the table 'Returnstatus'.

```
170 • INSERT INTO Returnstatus VALUES
171     (601,402,'Historical Chronicles','2024-01-15',978135792),
172     (602,407,'Classic Literature Classics','2024-04-28',978112233),
173     (603,404,'The Great Library Adventure','2024-05-01',978123486),
174     (604,401,'Cooking Adventures','2024-05-10',978987636),
175     (605,408,'Mystery at Midnight Manor','2024-04-30',978988554),
176     (606,409,'Classic Literature Classics','2023-11-06',978112233),
177     (607,406,'Science Explorations','2024-05-14',978543210),
178     (608,405,'Cooking Adventures','2024-04-18',978987636),
179     (609,404,'Poetry Anthology','2024-04-30',978135124),
180     (610,410,'Mystery at Midnight Manor','2024-05-15',978988554);
181
```

Display of 'Returnstatus' Table.

```
184 • SELECT * FROM Returnstatus;
```

Return_Id	Return_cust	Return_book_name	Return_date	Isbn_book2
601	402	Historical Chronides	2024-01-15	978135792
602	407	Classic Literature Classics	2024-04-28	978112233
603	404	The Great Library Adventure	2024-05-01	978123486
604	401	Cooking Adventures	2024-05-10	978987636
605	408	Mystery at Midnight Manor	2024-04-30	978988554
606	409	Classic Literature Classics	2023-11-06	978112233
607	406	Science Explorations	2024-05-14	978543210
608	405	Cooking Adventures	2024-04-18	978987636
609	404	Poetry Anthology	2024-04-30	978135124
610	410	Mystery at Midnight Manor	2024-05-15	978988554
NULL	NULL	NULL	NULL	NULL

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

```
188 • SELECT Book_title, Category, Rental_Price
189     FROM Books
190     WHERE Status = 'yes';
191
```

Output

Result Grid	Filter Rows:	Export:	Wrap Cell Content
Book_title	Category	Rental_Price	
Classic Literature Classics	Literature	24.00	
The Great Library Adventure	Fiction	20.00	
Poetry Anthology	Poetry	24.00	
Historical Chronicles	History	28.00	
Science Explorations	Science	30.00	
Historical Journeys	History	28.00	
Cooking Adventures	Cookbook	20.00	
Mystery at Midnight Manor	Mystery	20.00	

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

```
194 • SELECT Emp_name, Salary
195     FROM Employee
196     ORDER BY Salary DESC;
197
```

Output

Result Grid	Filter Rows:
Emp_name	Salary
Jithin	55000.00
Ajith	50000.00
Rohith	50000.00
Sneha	48000.00
Anila	40000.00
Shafeeq	35000.00
Rasheed	35000.00
Rahul	30000.00
Babu	28000.00
Sindhu	25000.00

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

```
200 • SELECT Books.Book_title, Customer.Customer_name
201 FROM Books
202 JOIN Issuestatus ON Books.Isbn = Issuestatus.Isbn_book
203 JOIN Customer ON Issuestatus.Issued_cust = Customer.Customer_Id;
204
```

Output

Result Grid	Filter Rows:	Export:	Wrap Cell Content
Book_title	Customer_name		
Historical Chronicles	Sumesh		
Classic Literature Classics	Hafiz		
The Great Library Adventure	Midhun		
Cooking Adventures	Alex		
Mystery at Midnight Manor	Vipin		
Classic Literature Classics	Navas		
Science Explorations	Rahul		
Cooking Adventures	Jishna		
Poetry Anthology	Midhun		
Mystery at Midnight Manor	Saranya		

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

```
207 • SELECT Category, COUNT(*) AS 'Total Count'
208 GROUP BY Category;
209
```



Output

Result Grid	Filter Rows:
Category	Total Count
Literature	1
Fantasy	1
Fiction	1
Poetry	1
History	2
Science	1
Puzzles	1
Cookbook	1
Mystery	1

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

```
213 • SELECT Emp_name,Position,Salary
214     FROM Employee
215     WHERE Salary > 50000;
216
```



Output

Result Grid   Filter Rows: <input type="text"/>			
	Emp_name	Position	Salary
▶	Jithin	IT Specialist	55000.00

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

```
219 • SELECT Customer_name
220     FROM Customer
221     WHERE Reg_date < '2022-01-01'
222     AND Customer_id NOT IN (SELECT Issued_cust FROM Issuestatus);
223
```


Output

Result Grid   Filter Rows: <input type="text"/>	
	Customer_name
▶	Roshan

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

```
226 • SELECT Branch_no, COUNT(*) AS Total_Employees
227     FROM Employee
228     GROUP BY Branch_no;
229
```


Output

Result Grid  Filter Rows: <input type="text"/>		
	Branch_no	Total_Employees
▶	102	6
	103	1
	104	1
	107	1
	110	1

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

```
232 • SELECT Customer.Customer_name
233     FROM Customer JOIN Issuestatus
234     ON Customer.Customer_Id = Issuestatus.Issued_cust
235     WHERE Issuestatus.Issue_date BETWEEN '2023-06-01' AND '2023-06-30';
236
```

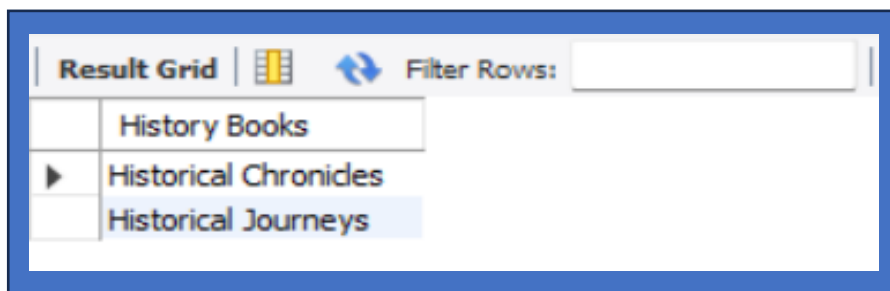
Output

Result Grid  Filter Rows: <input type="text"/>	
	Customer_name
▶	Sumesh
	Navas

9. Retrieve book_title from book table containing history.

```
239 • SELECT Book_title AS 'History Books'
240     FROM Books
241     WHERE Category LIKE '%history%';
242
```

Output

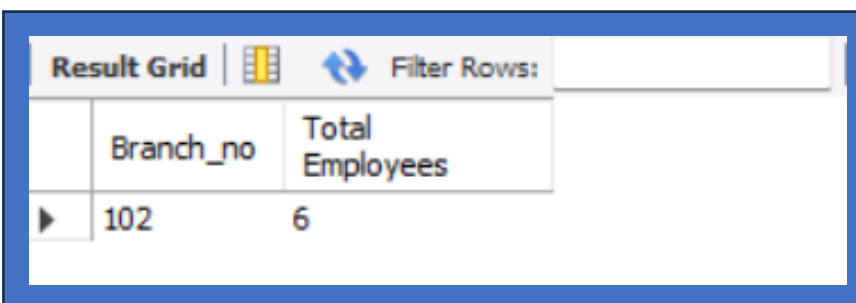


	History Books
▶	Historical Chronicles
	Historical Journeys

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

```
245 • SELECT Branch_no, COUNT(*) AS 'Total Employees'
246     FROM Employee
247     GROUP BY Branch_no
248     HAVING COUNT(*) > 5;
249
```

Output



	Branch_no	Total Employees
▶	102	6

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

```
252 • SELECT Employee.Emp_name, Branch.Branch_address
253 FROM Employee
254 JOIN Branch ON Employee.Branch_no = Branch.Branch_no;
255
```

Output

Emp_name	Branch_address
Ajith	Thalassery,Kannur
Anila	Thalassery,Kannur
Rahul	Kalpetta,Wayanad
Jithin	Thalassery,Kannur
Babu	Mavoor,Kozhikode
Shafeeq	Thalassery,Kannur
Sindhu	Chalakkudi,Thrissur
Rasheed	Thalassery,Kannur
Sneha	Thalassery,Kannur
Rohith	Pala,Kottayam

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

```
258 • SELECT Customer.Customer_name
259 FROM Customer
260 JOIN Issuestatus ON Customer.Customer_Id = Issuestatus.Issued_cust
261 JOIN Books ON Issuestatus.isbn_book = Books.Isbn
262 WHERE Books.Rental_Price > 25;
263
```

Output

Customer_name
Sumesh
Rahul

