

Library Management System

With MySql



This document contains the step by step procedure to develop a project to track the books and the related details in a library using MySql.

Step 1: Create a database named library and use it

Step 2: Add the following columns:


- Branch
- Employee
- Books
- Customer
- Issuestatus
- Returnstatus

Step 3: Display these tables

Branch

Result Grid				
Filter Rows:				
Edit:				
	branch_no	manager_id	branch_address	contact_no
▶	1	10	Trivandrum	8494946778
	2	11	Kollam	8494946777
	3	12	Alappuzha	8494946776
	4	13	Ernakulam	8494946775
	5	14	Kottayam	8494946774
	6	15	Pathanamthitta	8494946773
	7	16	Thrissur	8494946772
	8	17	Palakkad	8494946771
	9	18	Malappuram	8494946770
	10	19	Kozhikode	8494946769
	11	20	Kannur	8494946768
	12	21	Kasargod	8494946767
	13	22	Wayanad	8494946766
	14	23	Idukki	8494946765
•	NULL	NULL	NULL	NULL

Employee

Result Grid					
Filter Rows: <input type="text"/>					
Edit: 					
	emp_id	emp_name	position	salary	branch_no
▶	1100	Ameya	Clerk	20000	1
	1101	Jay	Clerk	20000	1
	1102	Akhila	LDC	30000	1
	1103	Lekshmi	Manager	50000	1
	1104	Akhil	Clerk	20000	1
	1105	Santhosh	Librarian	60000	1
	1106	Nithya	SeniorLibrarian	70000	1
	1107	Ameya	Clerk	20000	1
	1108	Leela	Librarian	60000	2
	1109	John	Clerk	20000	2
	1110	Paul	Clerk	20000	3
	1111	Stephen	Clerk	20000	4
	1112	Jain	Librarian	20000	5
	1113	Sandeep	Manager	50000	5
	1114	Neetha	Librarian	50000	6
	1115	Ashok	Manager	50000	6
	1116	Lal	Librarian	50000	7
	1117	Maya	Manager	50000	7
	1118	Celin	Clerk	20000	7
	1119	Ullas	Librarian	50000	8
	1120	Arun	Librarian	50000	9
	1121	Deepa	Clerk	20000	10
	1122	Arjun	Manager	20000	11
	1123	Devika	Librarian	20000	12
	1124	Roshan	Clerk	20000	13
	1125	Aravind	Manager	20000	13
	1126	Sankalp	LDC	20000	14
✱	NULL	NULL	NULL	NULL	NULL

Books

Result Grid		Filter Rows:		Edit:		Export/Import	
	ISBN	book_title	category	rental_price	status	author	
▶	123-456	Pride	Fiction	100.00	yes	Meera	
	123-457	Truth	Biography	100.00	yes	Meera	
	123-458	History of Modern India	History	200.00	yes	Ashoka	
	123-459	Mughals - A Brief History	History	50.00	yes	Bipin Chan	
	123-460	Networking Fundamentals	Engineering	150.00	yes	Imthias	
	123-461	Semiconductors	Engineering	100.00	yes	Gopakuma	
	123-462	Embedded C	Engineering	300.00	yes	Sreerag	
	123-463	Microelectronics	Engineering	100.00	no	Jubaina	
	123-464	The Kettle	Fiction	100.00	no	Nithya	
	123-465	Advanced Python	Engineering	250.00	no	Dean Paul	
	123-466	Introduction to Electrical ...	Engineering	100.00	yes	Shyba	
	123-467	Human Anatomy	Medical	50.00	yes	Meera	
	123-468	Science for Children	Science	100.00	no	Thomas	
	123-469	Fun with Maths	Mathematics	50.00	yes	Maya	
	123-470	Power Electronics	Engineering	100.00	yes	Nandan	
	123-471	Young Sheldon	Fiction	100.00	no	Philps	
	123-472	History of God	Mythology	25.00	no	Jeevan	
	123-473	The Truth	Biography	100.00	yes	JJ Charls	
●	NULL	NULL	NULL	NULL	NULL	NULL	

Customer

	customer_id	customer_name	customer_address	reg_date
▶	1	Anjali Menon	123 Coconut Grove, Kochi	2023-06-01
	2	Vijay Babu	246 Backwater Lane, Alappuzha	2023-07-10
	3	Maya Nair	357 Hill Station Rd, Munnar	2023-06-15
	4	Rajesh Pillai	468 Spice Market, Thekkady	2023-06-20
	5	Lakshmi Nair	579 Beach Road, Varkala	2023-06-25
	6	Ravi Kumar	111 Paddy Field, Kottayam	2021-12-15
	7	Sreelakshmi	222 Temple St, Thrissur	2021-11-20
	8	Nikhil Joseph	333 Hilltop, Idukki	2020-10-10
	9	Sneha Krishnan	444 Fort Road, Fort Kochi	2021-09-05
	10	Anoop Menon	555 Riverbank, Kasargod	2020-05-30
	11	Geetha Ravi	678 Kerala House, Thiruvananthapuram	2023-06-02
	12	Vineesh Kumar	789 Chai Shop Lane, Kottarakkott	2023-06-05
	13	Anu George	890 Ayurveda Rd, Wayanad	2024-06-12
	14	Deepak Reddy	901 Palm Tree Ave, Kozhikode	2023-06-18
	15	Meena Suresh	123 Spice Garden, Palakkad	2023-06-22
	16	Jithin Varma	234 Boat Jetty, Alleppey	2021-12-01
	17	Shantha Kumari	345 Heritage House, Kannur	2021-08-15
	18	Kiran Thomas	456 Sunset Point, Munnar	2020-09-22
	19	Ranjith Babu	567 Traditional House, Kottayam	2021-10-30
	20	Vani Krishna	678 Saffron Lane, Ernakulam	2021-07-25
•	NULL	NULL	NULL	NULL

issueStatus

	issue_id	issued_cust	issued_book_name	issue_date	isbn_book
▶	1	1	Pride	2023-06-01	123-456
	2	2	Truth	2023-06-10	123-457
	3	3	History of Modern India	2023-06-15	123-458
	4	4	Mughals - A Brief History	2023-06-20	123-459
	5	5	Networking Fundamentals	2023-06-25	123-460
	6	6	Semiconductors	2023-05-30	123-461
	7	7	Embedded C	2023-04-15	123-462
	8	8	Microelectronics	2023-03-10	123-463
	9	9	The Kettle	2023-02-05	123-464
	10	10	Advanced Python	2023-01-20	123-465
	11	11	Intoduction to Electrical ...	2023-06-02	123-466
	12	12	Human Anatomy	2023-06-05	123-467
	13	13	Science for Children	2023-06-12	123-468
	14	14	Fun with Maths	2023-06-18	123-469
	15	15	Power Electronics	2023-06-22	123-470
	16	16	Young Sheldon	2023-05-15	123-471
	17	17	History of God	2023-04-20	123-472
	18	18	The Truth	2023-03-15	123-473
✱	NULL	NULL	NULL	NULL	NULL

returnStatus

	return_id	return_cust	return_book_name	return_date	isbn_book2
▶	1	1	Pride	2023-07-15	123-456
	2	2	Truth	2023-07-20	123-457
	3	3	History of Modern India	2023-07-25	123-458
	4	4	Mughals - A Brief History	2023-07-30	123-459
	5	5	Networking Fundamentals	2023-08-05	123-460
	6	6	Semiconductors	2023-08-10	123-461
	7	7	Embedded C	2023-08-15	123-462
	8	8	Microelectronics	2023-08-20	123-463
	9	9	The Kettle	2023-08-25	123-464
	10	10	Advanced Python	2023-08-30	123-465
	11	11	Intoduction to Electrical ...	2023-08-02	123-466
	12	12	Human Anatomy	2023-08-05	123-467
	13	13	Science for Children	2023-08-10	123-468
	14	14	Fun with Maths	2023-08-15	123-469
	15	15	Power Electronics	2023-08-20	123-470
	16	16	Young Sheldon	2023-08-25	123-471
	17	17	History of God	2023-09-01	123-472
	18	18	The Truth	2023-09-05	123-473
✱	NULL	NULL	NULL	NULL	NULL

Step 4: Apply the below queries

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

Availability of the books are marked in the status column. Hence retrieve the book details where status is 'Yes'

```
214 -- Retrive the book title,category and rental price of all available books
215 • SELECT book_title,category,rental_price
216 FROM books
217 WHERE status='Yes';
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
book_title	category	rental_price	
Pride	Fiction	100.00	
Truth	Biography	100.00	
History of Modern India	History	200.00	
Mughals - A Brief History	History	50.00	
Networking Fundamentals	Engineering	150.00	
Semiconductors	Engineering	100.00	
Embedded C	Engineering	300.00	
Introduction to Electrical Engineering	Engineering	100.00	
Human Anatomy	Medical	50.00	
Fun with Maths	Mathematics	50.00	
Power Electronics	Engineering	100.00	
The Truth	Biography	100.00	

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

Salary can be ordered in the descending order using the ORDER BY and DESC keywords

```
219 -- List the employee names and their respective salaries in descending order of salary
220 • SELECT emp_name, salary
221 FROM employee
222 ORDER BY salary DESC;
```


	emp_name	salary
►	Nithya	70000
	Santhosh	60000
	Leela	60000
	Lekshmi	50000
	Sandeep	50000
	Neetha	50000
	Ashok	50000
	Lal	50000
	Maya	50000
	Ullas	50000
	Arun	50000
	Akhila	30000
	Ameya	20000
	Jay	20000
	Akhil	20000
	Ameya	20000
	John	20000
	Paul	20000
	Stephen	20000

	Jain	20000
	Celin	20000
	Deepa	20000
	Arjun	20000
	Devika	20000
	Roshan	20000
	Aravind	20000
	Sankalp	20000

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

Issued_cust in issueStatus table is a foreign key referenced to the customer_id in customer table. We can use this column to join customer table and issueStatus table and get the book titles and corresponding customer name for whom the book is issued

```
224      -- Retrieve the book titles and the corresponding customers who have issues the books
225 •    SELECT c.customer_name, i.issued_book_name
226      FROM issueStatus i LEFT JOIN customer c ON i.issued_cust=c.customer_id;
227
```

Result Grid	Filter Rows:
customer_name	issued_book_name
Anjali Menon	Pride
Vijay Babu	Truth
Maya Nair	History of Modern India
Rajesh Pillai	Mughals - A Brief History
Lakshmi Nair	Networking Fundamentals
Ravi Kumar	Semiconductors
Sreelakshmi	Embedded C
Nikhil Joseph	Microelectronics
Sneha Krishnan	The Kettle
Anoop Menon	Advanced Python
Geetha Ravi	Intoduction to Electrical ...
Vineesh Kumar	Human Anatomy
Anu George	Science for Children
Deepak Reddy	Fun with Maths
Meena Suresh	Power Electronics
Jithin Varma	Young Sheldon
Shantha Kumari	History of God
Kiran Thomas	The Truth

4. Display the total count of books in each category

COUNT() is the function used to count the number of occurrences. GROUP BY keyword can be used to get the category wise count.

```
-- Display the total count of books in each category
• SELECT category, COUNT(*) AS Num_of_books
   FROM books
  GROUP BY category;
```

Result Grid			Filter Rows:
	category	Num_of_books	
▶	Fiction	3	
	Biography	2	
	History	2	
	Engineering	7	
	Medical	1	
	Science	1	
	Mathematics	1	
	Mythology	1	

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

To retrieve data with a condition, use WHERE

```

233  -- Retrieve the employee names and their positions for the employees whose salaries are above 50,000
234  •  SELECT emp_name, position
235     FROM employee
236     WHERE salary>50000;

```

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	emp_name	position			
▶	Santhosh	Librarian			
	Nithya	SeniorLibrarian			
	Leela	Librarian			

Retrieve the salary column as well for better clarity

```

233  -- Retrieve the employee names and their positions for the employees whose salaries are above 50,000
234  •  SELECT emp_name, position, salary
235     FROM employee
236     WHERE salary>50000;

```

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	emp_name	position	salary		
▶	Santhosh	Librarian	60000		
	Nithya	SeniorLibrarian	70000		
	Leela	Librarian	60000		

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

Issued_cust is a foreign key referenced to customer_id in the customer table. Join both the tables using issued_cust. Combine the conditions using AND operator and apply WHERE keyword.

```
238 -- List the customer names who registered before 2022-01-01 and have not received any books yet.
239 • SELECT c.customer_name, c.reg_date
240 FROM customer c
241 LEFT JOIN issueStatus i ON c.customer_id = i.issued_cust
242 WHERE c.reg_date < '2022-01-01' AND i.issue_id IS NULL;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: [IA](#)

	customer_name	reg_date
▶	Ranjith Babu	2021-10-30
	Vani Krishna	2021-07-25

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

Use GROUP BY to get branch number wise count.

```
244 -- Display the branch number and total count of employees in each branch
245 • SELECT branch_no, COUNT(*) AS employee_count
246 FROM employee
247 GROUP BY branch_no;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: [IA](#)

	branch_no	employee_count
▶	1	8
	2	2
	3	1
	4	1
	5	2
	6	2
	7	3
	8	1
	9	1
	10	1
	11	1
	12	1
	13	2
	14	1

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

Issued_cust is a foreign key referenced to customer_id in the customer table. Join both the tables using issued_cust. Combine the conditions using BETWEEN operator and apply WHERE keyword.

```
249      -- Display the names of customers who have issued books in the month of June 2023
250 •    SELECT c.customer_name, i.issue_date
251      FROM customer c
252      JOIN issueStatus i ON c.customer_id = i.issued_cust
253      WHERE i.issue_date BETWEEN '2023-06-01' AND '2023-06-30';
```

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	customer_name	issue_date			
▶	Anjali Menon	2023-06-01			
	Vijay Babu	2023-06-10			
	Maya Nair	2023-06-15			
	Rajesh Pillai	2023-06-20			
	Lakshmi Nair	2023-06-25			
	Geetha Ravi	2023-06-02			
	Vineesh Kumar	2023-06-05			
	Anu George	2023-06-12			
	Deepak Reddy	2023-06-18			
	Meena Suresh	2023-06-22			

9. Retrieve book_title from book table containing history

LIKE is the keyword used to check patterns

```
254 -- Retrieve book_title from book table containing history
255 • SELECT book_title
256 FROM books
257 WHERE book_title LIKE '%history%';
```



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

	book_title
▶	History of Modern India
	Mughals - A Brief History
	History of God

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

GROUP BY is used to get branch number wise employee count. From that branch numbers with employee count greater than 5 is filtered using HAVING

```
259 -- Retrieve the branch numbers along with the count of employees for branches having more than 5 employees
260 • SELECT branch_no, COUNT(emp_id) AS employee_count
261 FROM employee
262 GROUP BY branch_no
263 HAVING COUNT(emp_id) > 5;
```

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

	branch_no	employee_count
▶	1	8

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

Join employee table and branch table using branch_no column. Then apply condition using WHERE

```
265 -- Retrieve the names of employees who manage branches and their respective branch address
266 • SELECT e.emp_name,e.position,b.branch_address
267 FROM employee e
268 LEFT JOIN branch b ON e.branch_no=b.branch_no
269 WHERE e.position='Manager';
```

emp_name	position	branch_address
Lekshmi	Manager	Trivandrum
Sandeep	Manager	Kottayam
Ashok	Manager	Pathanamthitta
Maya	Manager	Thrissur
Arjun	Manager	Kannur
Aravind	Manager	Wayanad

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

Customer name is available in the customer table. Customer_ids for those customers who have issued books is available in the issueStatus table. Join customer table and issueStatus table using customer_id column and issued_cust column to get the customer names corresponding to issued_cust.. Then join this with books table to get the rental_price

```
271 -- Display the names of customers who have issued books with a rental price higher than Rs.25
272 • SELECT DISTINCT c.customer_name, b.rental_price
273 FROM customer c
274 JOIN issueStatus i ON c.customer_id = i.issued_cust
275 JOIN books b ON i.isbn_book = b.isbn
276 WHERE b.rental_price > 25;
277
```

Result Grid



Filter Rows:

	customer_name	rental_price
▶	Anjali Menon	100.00
	Vijay Babu	100.00
	Maya Nair	200.00
	Rajesh Pillai	50.00
	Lakshmi Nair	150.00
	Ravi Kumar	100.00
	Sreelakshmi	300.00
	Nikhil Joseph	100.00
	Sneha Krishnan	100.00
	Anoop Menon	250.00
	Geetha Ravi	100.00
	Vineesh Kumar	50.00
	Anu George	100.00
	Deepak Reddy	50.00
	Meena Suresh	100.00
	Jithin Varma	100.00
	Kiran Thomas	100.00