

Module End Project

Topic : Library Management System

You are going to build a project based on Library Management System. It keeps track of all information about books in the library, their cost, status and total number of books available in the library.

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

The screenshot shows the MySQL Workbench interface. In the top navigation bar, 'Local instance MySQL80' is selected. The 'File' menu is open, showing options like 'Edit', 'View', 'Query', 'Database', 'Server', 'Tools', 'Scripting', and 'Help'. Below the menu is a toolbar with various icons. The 'Navigator' pane on the left lists schemas: company, organisation, product, sale (selected), sales, school, sys, and testdb. The 'task8*' tab in the center contains a SQL editor with the following code:

```
1 • create database library;
2 • show databases;
3 • USE library;
4
5 • create table branch(branch_no int primary key,
6     manager_id int,
7     branch_address varchar(30),
8     contact_no int);
9
```

Below the SQL editor is a 'Result Grid' table with four columns: branch_no, manager_id, branch_address, and contact_no. The first row has all values set to 'NULL'. At the bottom of the window, the 'Output' pane shows the execution history:

#	Time	Action	Message	Duration / Fetch
1	20:47:25	create database library	1 row(s) affected	0.015 sec
2	20:47:40	show databases	12 row(s) returned	0.000 sec / 0.000 sec
3	20:47:49	USE library	0 row(s) affected	0.000 sec
4	20:50:16	create table branch(branch_no int primary key, manager_id int, branch_address varchar(30), contact_no int);	0 row(s) affected	0.078 sec
5	20:50:22	select * from branch LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec

```

MySQL Workbench - Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
Navigator: task8* SQL File 5* SQL File 6* project*
schemas
company organisation product
sale
Tables Views Stored Procedures
sales school sys testdb
Administration Schemas Information
No object selected
Object Info Session
Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: |
branch_no manager_id branch_address contact_no
1 100 1ST STREET 11111
2 101 2ND STREET 22222
3 102 3RD STREET 33333
4 103 4TH STREET 44444
5 104 5TH STREET 55555
HULL HULL HULL HULL
branch 3
Output
Action Output
# Time Action Message Duration / Fetch
3 20:47:49 USE library 0 row(s) affected 0.000 sec
4 20:50:16 create table branch(branch_no int primary key, manager_id int, branch_address var... 0 row(s) affected 0.070 sec
5 20:50:22 select * from branch LIMIT 0, 1000 0 row(s) returned 0.000 sec / 0.000 sec
6 20:59:31 insert into branch (branch_no,manager_id,branch_address,contact_no) values(1,100,... 5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0 0.016 sec
7 20:59:37 select * from branch LIMIT 0, 1000 5 row(s) returned 0.000 sec / 0.000 sec

```

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

```

MySQL Workbench - Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
Navigator: task8* SQL File 5* SQL File 6* project*
schemas
company organisation product
sale
Tables Views Stored Procedures
sales school sys testdb
Administration Schemas Information
No object selected
Object Info Session
Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: |
employee_id employee_name position salary branch_no
100 sunil chetri manager 50000 1
200 leo messi engineer 25000 2
300 c ronaldo asst engineer 22000 3
400 neymar jr operator 18000 3
500 bekham david hr 25000 2
HULL HULL HULL HULL
employee 5
Output
Action Output
# Time Action Message Duration / Fetch
8 21:03:18 create table employee(employee_id int primary key, employee_name varchar(30), po... 0 row(s) affected 0.062 sec
9 21:03:22 select * from employee LIMIT 0, 1000 0 row(s) returned 0.000 sec / 0.000 sec
10 21:11:43 insert into employee (employee_id,employee_name,position,salary,branch_no) value... 5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0 0.032 sec
11 21:11:46 select * from employee LIMIT 0, 1000 5 row(s) returned 0.000 sec / 0.000 sec

```

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

MySQL Workbench - Local instance MySQL80

Schema:

```

49 • insert into books (isbn,book_title,category,rental_price,status,author,publisher)
values
50
51 ('12345','The Hobbit','Fantasy',100,'yes','JRR Tolkien','amazon'),
52 ('23456','The Alchemist','Adventure',150,'yes','Paulo Coelho','flipcart'),
53 ('34567','Dream Of The Red Chamber','fantasy',200,'no','Cao Xueqin','amazon'),
54 ('45678','Gone Girl','horror',250,'no','Gillian Flynn','disney'),
55 ('56789','Rebecca','crime',250,'yes','Daphne Du Maurier','dc');
56
57 • select * from books;
  
```

Result Grid:

isbn	book_title	category	rental_price	status	author	publisher
12345	The Hobbit	Fantasy	100	yes	JRR Tolkien	amazon
23456	The Alchemist	Adventure	150	yes	Paulo Coelho	flipcart
34567	Dream Of The Red Chamber	fantasy	200	no	Cao Xueqin	amazon
45678	Gone Girl	horror	250	no	Gillian Flynn	disney
56789	Rebecca	crime	250	yes	Daphne Du Maurier	dc

Action Output:

#	Time	Action	Message	Duration / Fetch
12	21:42:12	create table books(isbn int primary key, book_title varchar(50), category varchar(30))	0 row(s) affected	0.047 sec
13	21:42:24	insert into books (isbn,book_title,category,rental_price,status,author,publisher) values ('12345','The Hobbit','Fantasy',100,'yes','JRR Tolkien','amazon')	Error Code: 1136. Column count doesn't match value count at row 3	0.000 sec
14	21:44:12	insert into books (isbn,book_title,category,rental_price,status,author,publisher) values ('23456','The Alchemist','Adventure',150,'yes','Paulo Coelho','flipcart')	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
15	21:44:22	select * from books LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec

4. Customer

Customer_Id - Set as PRIMARY KEY
Customer_name
Customer_address
Reg_date

MySQL Workbench - Local instance MySQL80

Schema:

```

66 • insert into customer (cust_id,cust_name,cust_address,reg_date)
value_
Execute the statement under the keyboard cursor
67
68 ('10','henrich klassen','abc road','2024-01-01'),
69 ('20','marco jansen','efg street','2021-02-02'),
70 ('30','devald brevis','hmi lane','2020-03-03'),
71 ('40','aiden markram','zxc road','2022-04-04'),
72 ('50','temba bhuma','asd street','2023-05-05');
73
74 • select * from customer;
  
```

Result Grid:

cust_id	cust_name	cust_address	reg_date
10	henrich klassen	abc road	2024-01-01
20	marco jansen	efg street	2021-02-02
30	devald brevis	hmi lane	2020-03-03
40	aiden markram	zxc road	2022-04-04
50	temba bhuma	asd street	2023-05-05

Action Output:

#	Time	Action	Message	Duration / Fetch
15	21:44:22	select * from books LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
16	21:46:32	create table customer(cust_id int primary key, cust_name varchar(30), cust_address...)	0 row(s) affected	0.062 sec
17	19:31:11	insert into customer (cust_id,cust_name,cust_address,reg_date) values ('10','henrich...')	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
18	19:31:15	select * from customer LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec

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

The screenshot shows the MySQL Workbench interface with the following details:

- Schemas:** Local instance MySQL80 contains the schema with tables: company, organisation, product, sale, sales, school, sys, testdb.
- SQL Editor:** Contains the following SQL code:

```
77 issued_cus int,
78 issued_book_name varchar(50),
79 issue_date date,
80 isbn_book varchar(50),
81 foreign key(issued_cus) references customer(cust_id),
82 foreign key(isbn_book) references books(isbn)
83 );
84
85 • select * from issuestatus;
86
```
- Result Grid:** Shows a table with columns: issue_id, issued_cus, issued_book_name, issue_date, isbn_book. All rows are NULL.
- Output:** Action Output shows the history of operations:

#	Time	Action	Message	Duration / Fetch
38	20:22:15	select * from customer LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
39	20:22:23	select * from books LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
40	20:23:46	create table issuestatus(issue_id int primary key,issued_cus int,issued_book_name varchar(50),issue_date date, isbn_book varchar(50))	0 row(s) affected	0.078 sec
41	20:23:59	select * from issuestatus LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec

The screenshot shows the MySQL Workbench interface with the following details:

- Schemas:** Local instance MySQL80 contains the schema with tables: company, organisation, product, sale, sales, school, sys, testdb.
- SQL Editor:** Contains the following SQL code:

```
85 • select * from issuestatus;
86
87 • insert into issuestatus(issue_id,issued_cus,issued_book_name,issue_date,isbn_book)
88 values
89 (111,10,'The Hobbit','2023-01-01','09876'),
90 (112,20,'The Alchemist','2022-02-02','98765'),
91 (113,30,'Dream Of The Red Chamber','2021-03-03','87654'),
92 (114,40,'Gone Girl','2020-04-04','76543'),
93 (115,50,'Rebecca','2022-04-05','65432');
94
95
96 • create table ReturnStatus (
97     Return_Id INT PRIMARY KEY,
```
- Result Grid:** Shows a table with columns: issue_id, issued_cus, issued_book_name, issue_date, isbn_book. Data rows are:

issue_id	issued_cus	issued_book_name	issue_date	isbn_book
111	10	The Hobbit	2023-01-01	09876
112	20	The Alchemist	2022-02-02	98765
113	30	Dream Of The Red Chamber	2021-03-03	87654
114	40	Gone Girl	2020-04-04	76543
115	50	Rebecca	2022-04-05	65432
- Output:** Action Output shows the history of operations:

#	Time	Action	Message	Duration / Fetch
1	20:23:59	insert into issuestatus(issue_id,issued_cus,issued_book_name,issue_date,isbn_book)	5 row(s) inserted	0.000 sec / 0.000 sec
2	20:24:00	create table ReturnStatus (0 row(s) affected	0.000 sec / 0.000 sec
3	20:24:00	Return_Id INT PRIMARY KEY,	0 row(s) affected	0.000 sec / 0.000 sec

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

```

CREATE TABLE returnstatus (
    Return_Id INT PRIMARY KEY,
    Return_cust INT,
    Return_book_name VARCHAR(50),
    Return_date DATE,
    ISBN_book2 VARCHAR(100),
    FOREIGN KEY (ISBN_book2) REFERENCES Books(ISBN)
);

SELECT * FROM returnstatus;

```

Result Grid:

Return_Id	Return_cust	Return_book_name	Return_date	ISBN_book2
NULL	NULL	NULL	NULL	NULL

Action Output:

#	Time	Action	Message	Duration / Fetch
43	20:28:05	create table ReturnStatus (Return_Id INT PRIMARY KEY, Return_cust INT, Return_book_name VARCHAR(50), Return_date DATE, ISBN_book2 VARCHAR(100), FOREIGN KEY (ISBN_book2) REFERENCES Books(ISBN));	0 row(s) affected	0.062 sec
44	20:39:39	insert into issuestatus(issue_id,issued_cus,issued_book_name,issue_date,ISBN_boo...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
45	20:39:46	select * from issuestatus LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
46	20:42:55	select * from returnstatus LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec

Display all the tables and Write the queries for the following :

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

```

SELECT * FROM returnstatus;

SELECT book_title, category, rental_price FROM books;

```

Result Grid:

book_title	category	rental_price
The Hobbit	Fantasy	100
The Alchemist	Adventure	150
Dream Of The Red Chamber	fantasy	200
Gone Girl	horror	250
Rebecca	crime	250

Action Output:

#	Time	Action	Message	Duration / Fetch
44	20:39:39	insert into issuestatus(issue_id,issued_cus,issued_book_name,issue_date,ISBN_boo...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
45	20:39:46	select * from issuestatus LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
46	20:42:55	select * from returnstatus LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
47	20:44:32	select book_title,category,rental_price from books LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec

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

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project SQL File 6*

```

100     Return_date DATE,
101     Isbn_book2 VARCHAR(100),
102     FOREIGN KEY (Isbn_book2) REFERENCES Books(ISBN)
103   );
104
105 •   select * from returnstatus;
106
107 •   select book_title,category,rental_price from books;
108
109 •   select employee_name,salary from employee order by salary desc;

```

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

employee_name	salary
sunil chetri	50000
leo messi	25000
bekham david	25000
c ronaldo	22000
neymar jr	18000

employee 14 x Read Only

Action Output

#	Time	Action	Message	Duration / Fetch
46	20:42:55	select * from returnstatus LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
47	20:44:32	select book_title,category,rental_price from books LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
48	20:46:34	select employee_name,salary from employee order by salary desc LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec

Activate Windows Go to Settings to activate Windows 0.000 sec / 0.000 sec

No object selected

Object Info Session

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

Schemas

```

61 WHERE STATUS = 'yes' ;
62
63 •   SELECT Emp_name, Salary
64   FROM Employee
65   ORDER BY Salary DESC;
66
67 •   SELECT i.Issued_book_name, c.Cust_name
68   FROM IssueStatus i
69   JOIN Customer c ON i.Issued_cust = c.Cust_Id;
70 •   select * from issued_book_name;
71

```

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

Issued_book_name	cust_name
The Hobbit	henrich klassen
The Alchemist	marco jansen
Dream Of The Red Chamber	devald brevis
Gone Girl	aiden markram
Rebecca	temba bhuma

Field Types

No object selected

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

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project* SQL File 6*

```

106 •   select book_title,category,rental_price from books;
107 •   select employee_name,salary from employee order by salary desc;
108
109 •   SELECT Issued_book_name, cust_name
110     FROM IssueStatus
111   JOIN Customer ON issued_cust = cust_Id;
112
113 •   SELECT Category, COUNT(*) AS Total_Count
114     FROM Books
115   GROUP BY Category;
116
117
118

```

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

Category	Total_Count
Fantasy	2
Adventure	1
horror	1
crime	1

Activate Windows Read Only Go to Settings to activate Windows

Object Info Session

5. Retrieve the employee names and their positions for the employees whose salaries are above Rs.30,000.

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project* SQL File 6*

```

111 •   SELECT i.issued_book_name, c.cust_name
112     FROM issuestatus i JOIN customer c ON i.issued_cust = c.cust_id;
113
114
115 •   SELECT Category, COUNT(*) AS Total_Count
116     FROM Books
117   GROUP BY Category;
118
119 •   SELECT Employee_name, Position
120     FROM Employee
121   WHERE Salary > 30000;

```

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

Employee_name	Position
sunil chetri	manager

Employee 21 x Read Only

Action Output

#	Time	Action	Message
71	21:15:49	SELECT Employee_name, Position FROM Employee WHERE Salary > 50000 LIMIT...	0 row(s) returned
72	21:15:55	SELECT Employee_name, Position FROM Employee WHERE Salary > 30000 LIMIT...	1 row(s) returned

Activate Windows Duration / Fetch 0.000 sec / 0.000 sec Go to Settings to activate Windows 0.000 sec / 0.000 sec

Object Info Session

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

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project* SQL File 6*

```

115 •   SELECT Category, COUNT(*) AS Total_Count
116     FROM Books
117     GROUP BY Category;
118
119 •   SELECT Employee_name, Position
120     FROM Employee
121     WHERE Salary > 30000;
122
123
124 •   SELECT Cust_name
125     FROM Customer
126     WHERE Reg_date < '2022-01-01'
127     AND Cust_Id NOT IN (SELECT Issued_cust FROM IssueStatus);

```

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

Cust_name
marco jansen
deavid brevis

Customer 23 x

Activate Windows Go to Settings to activate Windows.

Object Info Session

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

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project* SQL File 6*

```

128     FROM Employee
129     WHERE Execute the statement under the keyboard cursor
130
131
132     SELECT b.Branch_no, COUNT(*) AS Total_Employees
133     FROM Branch b
134     JOIN Employee e ON b.Branch_no = e.Branch_no
135     GROUP BY b.Branch_no

```

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

Branch_no	Total_Employees
1	1
2	2
3	2

Result 24 x

Activate Windows Go to Settings to activate Windows.

Object Info Session

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

The screenshot shows the MySQL Workbench interface with a query editor window. The schema tree on the left shows databases like company, organisation, product, sale, sales, school, sys, and testdb. The query editor contains the following SQL code:

```

86   FROM Branch b
87   JOIN Employee e ON b.Branch_no = e.Branch_no
88   GROUP BY b.Branch_no;
89
90 •   SELECT DISTINCT c.Cust_name
91   FROM Customer c
92   JOIN IssueStatus i ON c.Customer_Id = i.Issued_cust
93   WHERE EXTRACT(MONTH FROM i.Issue_date) = 6 AND EXTRACT(YEAR FROM i.Issue_date) = 2023;
94

```

The result grid shows one row:

cust_name	issue_date
The Hobbit	2023-06-06

Below the result grid, the message "No object selected" is displayed.

9. Retrieve book_title from book table containing history.

The screenshot shows the MySQL Workbench interface with a query editor window. The schema tree on the left shows the same set of databases. The query editor contains the following SQL code:

```

135 •   SELECT c.Cust_name,i.issue_date
136   FROM Customer c
137   left JOIN IssueStatus i ON c.Cust_Id = i.Issued_cust
138   WHERE EXTRACT(MONTH FROM i.Issue_date) = 6 ;
139
140 •   SELECT Book_title
141   FROM Books
142   WHERE Category = 'fantasy';
143

```

The result grid shows two rows:

Book_title
The Hobbit
Dream Of The Red Chamber

Below the result grid, the message "No object selected" is displayed.

On the right side of the interface, there is an "Output" window titled "Books 37 x". It contains an "Action Output" table with two entries:

#	Time	Action	Message
96	21:36:26	SELECT c.Cust_name,i.issue_date FROM Customer c left JOIN IssueStatus i ON c.Cust_Id = i.Issued_cust WHERE EXTRACT(MONTH FROM i.Issue_date) = 6 ;	0 row(s) returned
97	21:38:13	SELECT Book_title FROM Books WHERE Category = 'fantasy' LIMIT 0, 1000	2 row(s) returned

The status bar at the bottom right indicates "Activate Window Duration / Fetch 0.000 sec / 0.000 sec Go to Settings to activate Window 0.000 sec / 0.000 sec".

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

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator: task8* SQL File 5* SQL File 6* project* sql6*

Filter objects

Schemas

- company
- library
- organisation
- product
- sale**
- Tables
- Views
- Stored Procedures
- Functions
- sales
- school
- sys
- testdb

Administration Schemas

No object selected

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

Branch_no	Total_Employees
1	4
2	4

Result Grid Form Editor Field Types

Result 8 x

Output:

Action Output

#	Time	Action	Message
35	20:39:01	insert into employee (employee_id,employee_name,position,salary,branch_no) values (600,'sunil kumar','manager',51000,1), (700,'leo das','engineer',25000,1), (800,'c raktinch','asst engineer',22000,1), (900,'michel jr','operator',18000,2), (000,'luis david','hr',25000,2);	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0 Duration / Fetch 0.031 sec

Activate Windows Go to Settings to activate Windows.

Read Only

Duration / Fetch 0.031 sec