

## **Topic : Library Management System**

### **Question**

You are going to build a project based on the 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.

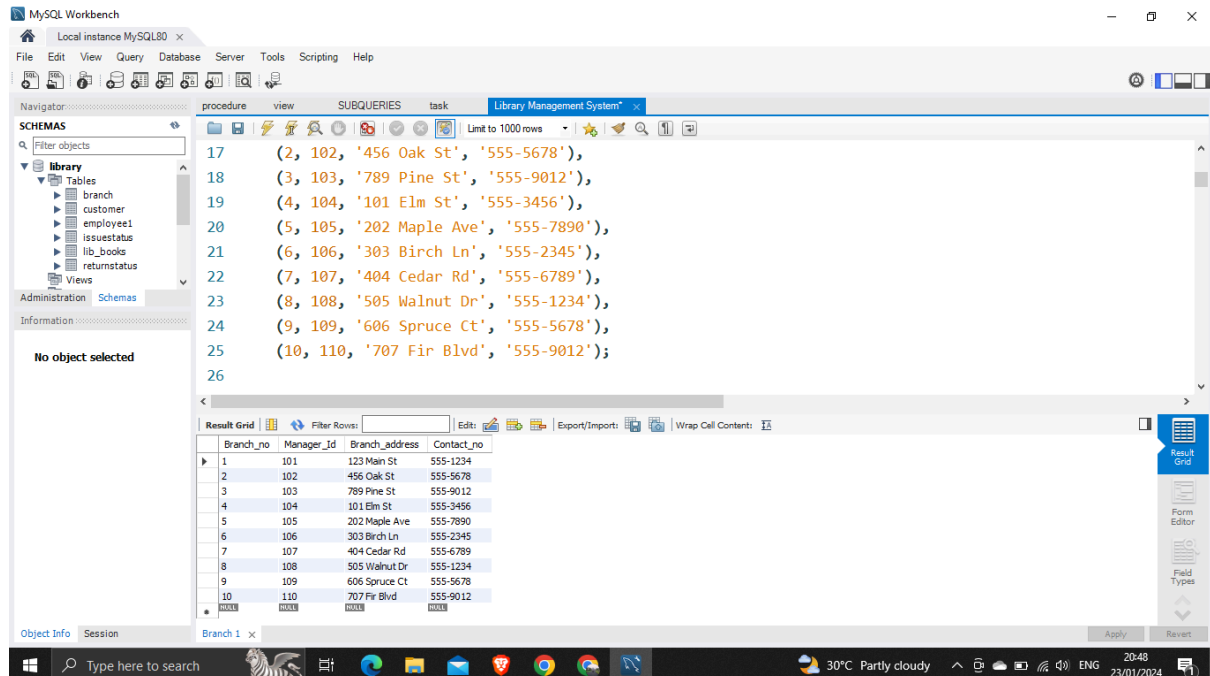
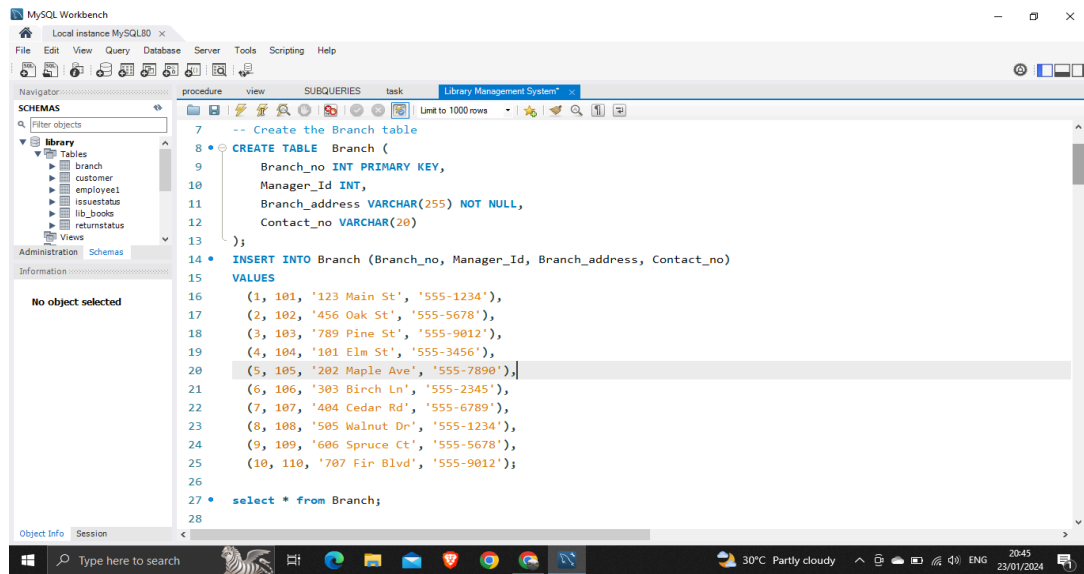
Create a database named library and the following TABLES in the database:

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

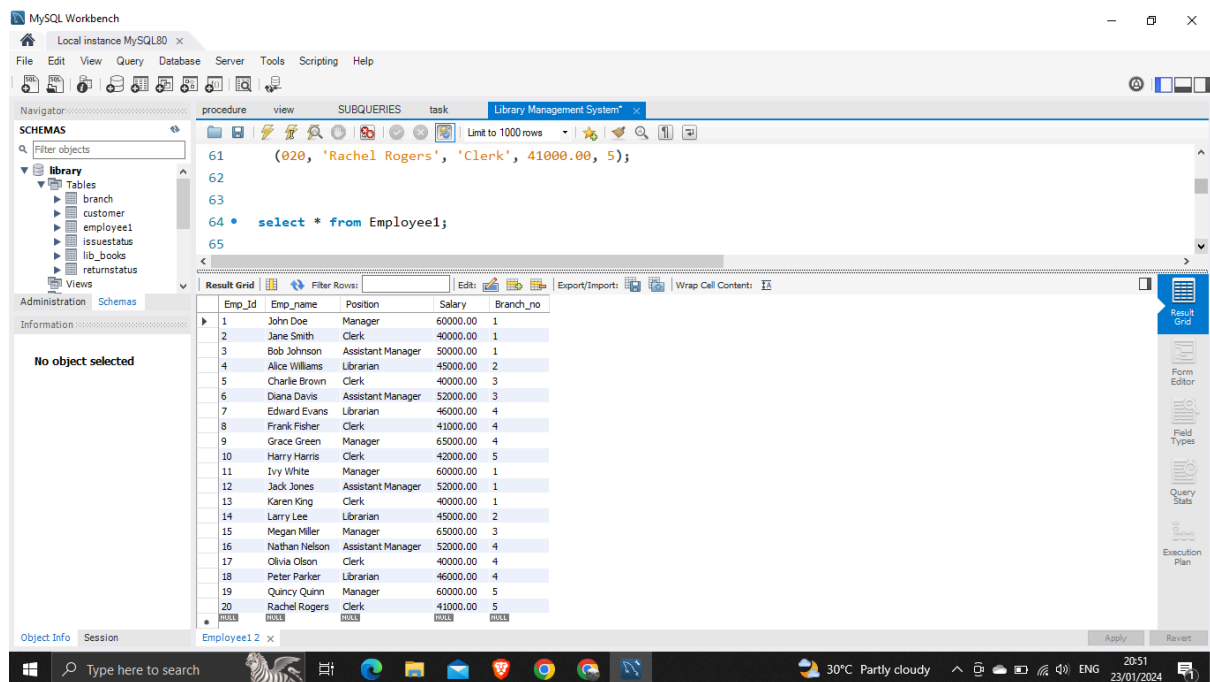
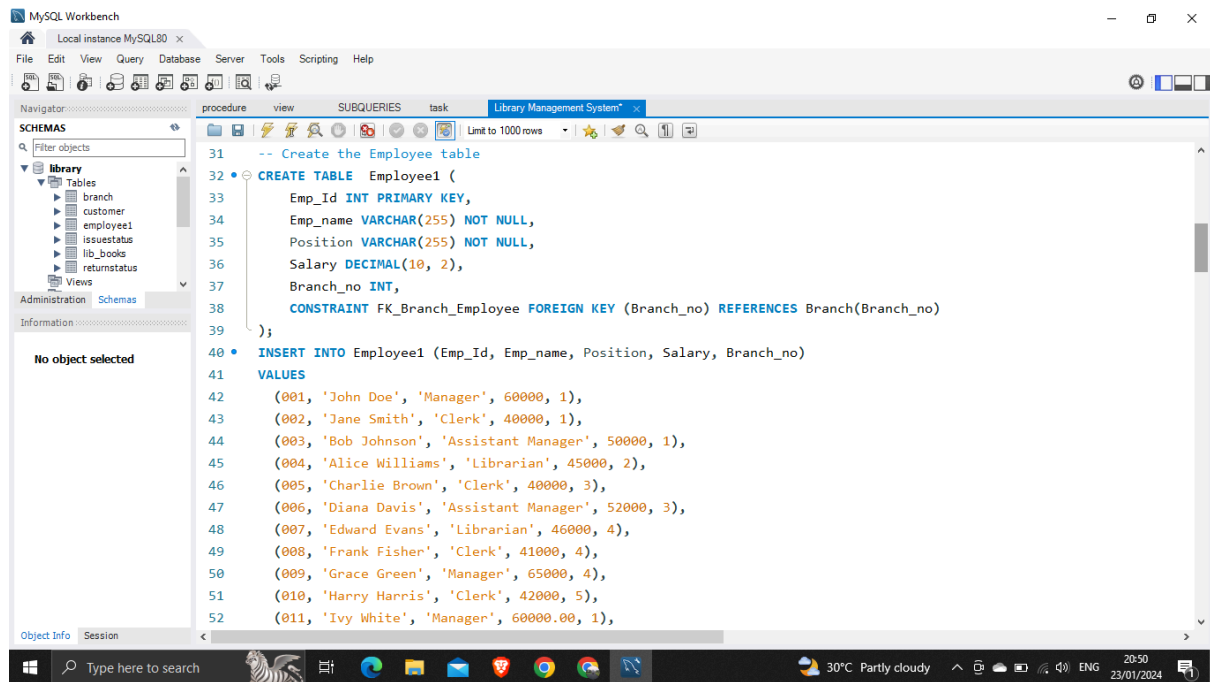
### **Answer**

- 1.Branch Table: Stores information about different branches of the library, including branch numbers, manager IDs, addresses, and contact numbers.
- 2.Employee Table: Manages details of library staff, such as employee IDs, names, positions, salaries, and the branch to which they are assigned.
- 3.Books Table: Contains details about the books available in the library, including ISBN, book title, category, rental price, availability status, author, and publisher.
- 4.Customer Table: Stores information about library patrons, including customer IDs, names, addresses, and registration dates.
- 5.IssueStatus Table: Records details about book issuances, including issuance IDs, customer IDs, issued book names, and issuance dates.
- 6.ReturnStatus Table: Manages information about book returns, including return IDs, customer IDs, returned book names, return dates, and ISBNs.

### **1. Branch Table**



## 2. Employee Table



### 3. Books Table

The screenshot shows the MySQL Workbench interface with the 'Library Management System' database selected. The 'Schemas' pane on the left shows the 'library' database containing tables like 'branch', 'customer', 'employee1', 'issuestatus', 'lib\_books', and 'returnstatus'. The main editor displays SQL code to create the 'Lib\_Books' table and insert 10 records.

```
-- Create the Books table
CREATE TABLE Lib_Books (
  ISBN INT PRIMARY KEY,
  Book_title VARCHAR(255) NOT NULL,
  Category VARCHAR(255),
  Rental_Price DECIMAL(8, 2),
  Status ENUM('yes', 'no') NOT NULL,
  Author VARCHAR(255),
  Publisher VARCHAR(255)
);

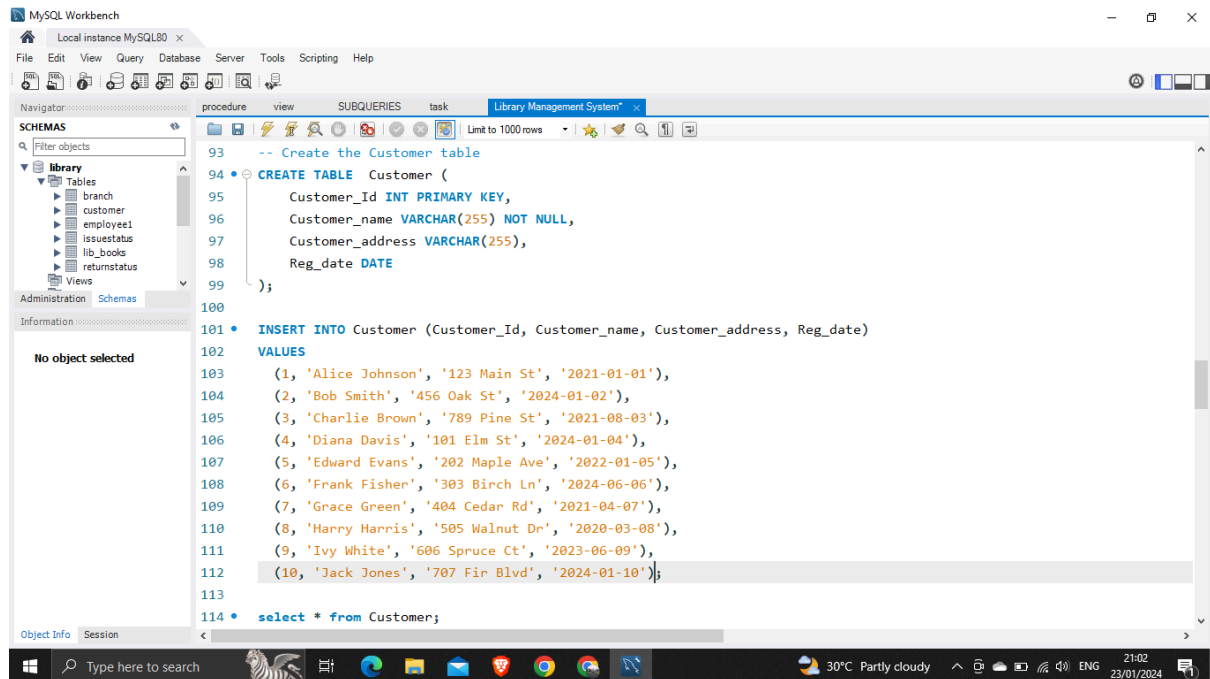
INSERT INTO Lib_Books (ISBN, Book_title, Category, Rental_Price, Status, Author, Publisher)
VALUES
  ('1001', 'The Catcher in the Rye', 'Fiction', 3.99, 'Yes', 'J.D. Salinger', 'Little, Brown and Company'),
  ('1002', 'To Kill a Mockingbird', 'Fiction', 4.99, 'Yes', 'Harper Lee', 'J.B. Lippincott & Co.'),
  ('1003', '1984', 'Dystopian', 5.99, 'Yes', 'George Orwell', 'Secker & Warburg'),
  ('1004', 'The Great Gatsby', 'Classic', 3.99, 'No', 'F. Scott Fitzgerald', 'Scribner'),
  ('1005', 'The Hobbit', 'Fantasy', 6.99, 'Yes', 'J.R.R. Tolkien', 'Allen & Unwin'),
  ('1006', 'The Renaissance: Art and Culture', 'History', 14.50, 'no', 'Michael Renaissance Scholar', 'Artistic Books'),
  ('1007', 'The Da Vinci Code', 'Mystery', 7.99, 'No', 'Dan Brown', 'Doubleday'),
  ('1008', 'Harry Potter and the Sorcerer's Stone', 'Fantasy', 6.99, 'Yes', 'J.K. Rowling', 'Bloomsbury'),
  ('1009', 'The History of Ancient Civilizations', 'History', 12.99, 'yes', 'John Historian', 'Academic Press'),
  ('1010', 'The Hunger Games', 'Science Fiction', 5.99, 'No', 'Suzanne Collins', 'Scholastic');
```

The screenshot shows the MySQL Workbench interface with the 'Library Management System' database selected. The 'Schemas' pane on the left shows the 'library' database containing tables like 'branch', 'customer', 'employee1', 'issuestatus', 'lib\_books', and 'returnstatus'. The main editor displays SQL code to select all records from the 'Lib\_Books' table. The 'Result Grid' at the bottom shows the data returned by the query.

```
select * from Lib_Books;
```

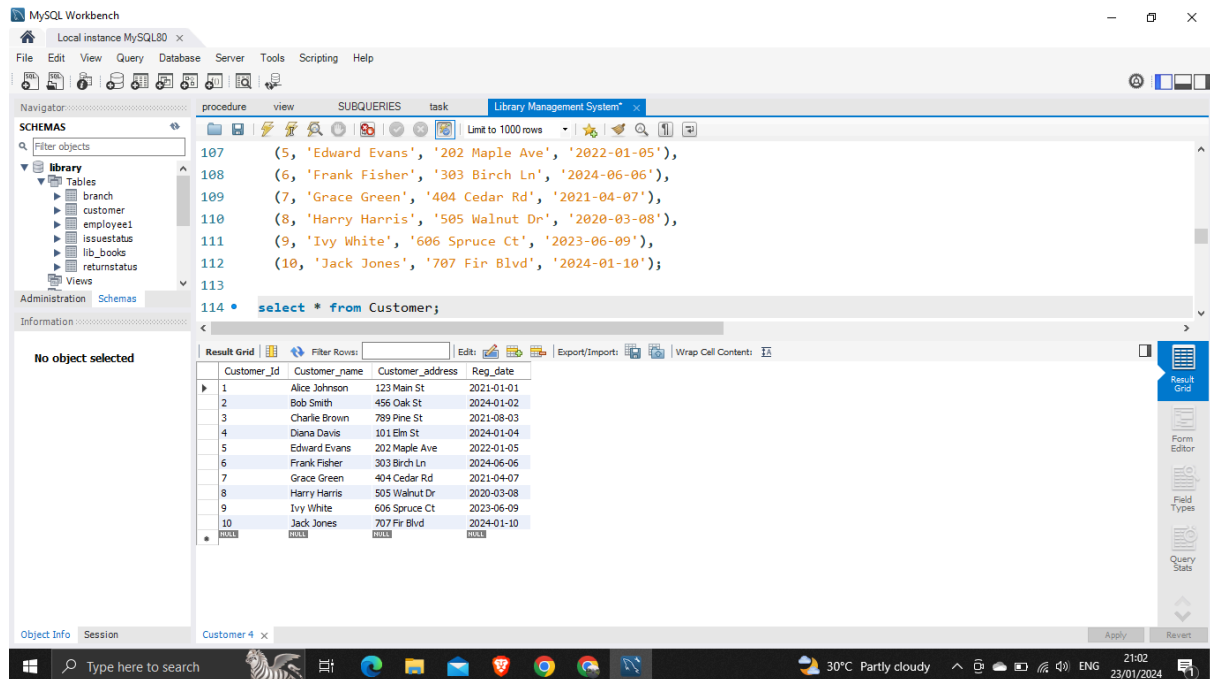
ISBN	Book_title	Category	Rental_Price	Status	Author	Publisher
1001	The Catcher in the Rye	Fiction	3.99	yes	J.D. Salinger	Little, Brown and Company
1002	To Kill a Mockingbird	Fiction	4.99	yes	Harper Lee	J.B. Lippincott & Co.
1003	1984	Dystopian	5.99	yes	George Orwell	Secker & Warburg
1004	The Great Gatsby	Classic	3.99	no	F. Scott Fitzgerald	Scribner
1005	The Hobbit	Fantasy	6.99	yes	J.R.R. Tolkien	Allen & Unwin
1006	The Renaissance: Art and Culture	History	14.50	no	Michael Renaissance Scholar	Artistic Books
1007	The Da Vinci Code	Mystery	7.99	no	Dan Brown	Doubleday
1008	Harry Potter and the Sorcerer's Stone	Fantasy	6.99	yes	J.K. Rowling	Bloomsbury
1009	The History of Ancient Civilizations	History	12.99	yes	John Historian	Academic Press
1010	The Hunger Games	Science Fiction	5.99	no	Suzanne Collins	Scholastic

## 4. Customer Table



The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with 'library' expanded, showing tables like 'branch', 'customer', 'employee1', 'issuestatus', 'lib\_books', and 'returnstatus'. The main editor window shows a SQL script for creating the 'Customer' table and inserting 10 records. The script is as follows:

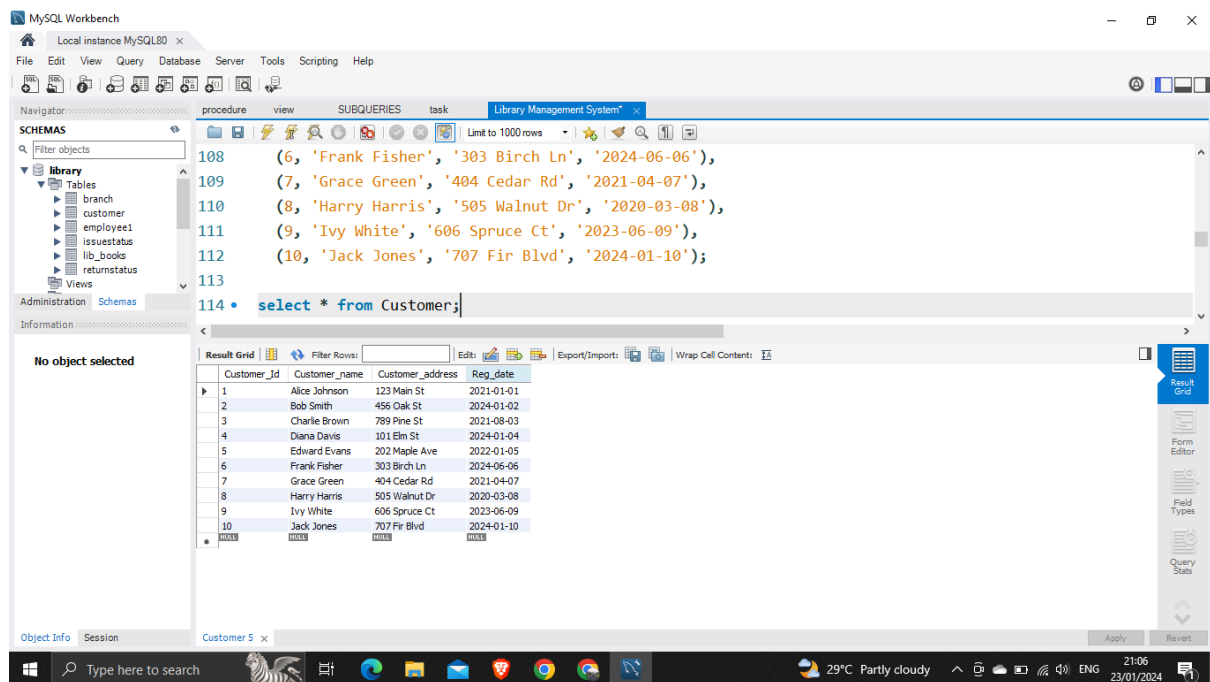
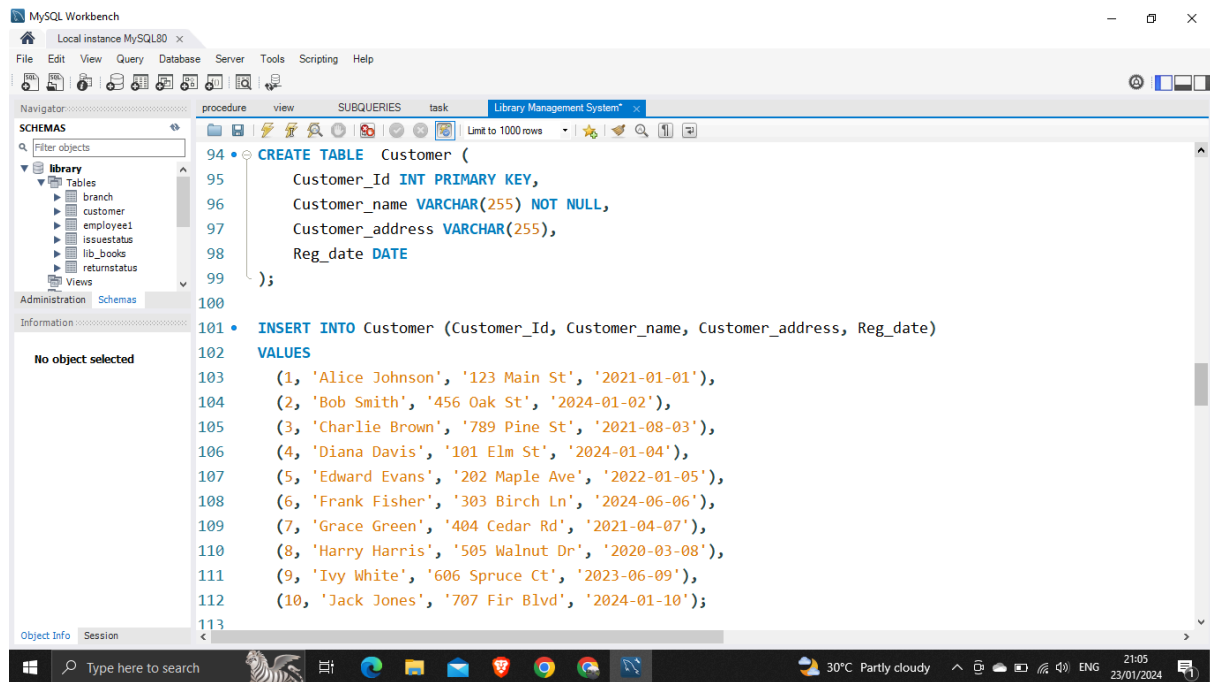
```
93 -- Create the Customer table
94 CREATE TABLE Customer (
95     Customer_Id INT PRIMARY KEY,
96     Customer_name VARCHAR(255) NOT NULL,
97     Customer_address VARCHAR(255),
98     Reg_date DATE
99 );
100
101 INSERT INTO Customer (Customer_Id, Customer_name, Customer_address, Reg_date)
102 VALUES
103     (1, 'Alice Johnson', '123 Main St', '2021-01-01'),
104     (2, 'Bob Smith', '456 Oak St', '2024-01-02'),
105     (3, 'Charlie Brown', '789 Pine St', '2021-08-03'),
106     (4, 'Diana Davis', '101 Elm St', '2024-01-04'),
107     (5, 'Edward Evans', '202 Maple Ave', '2022-01-05'),
108     (6, 'Frank Fisher', '303 Birch Ln', '2024-06-06'),
109     (7, 'Grace Green', '404 Cedar Rd', '2021-04-07'),
110     (8, 'Harry Harris', '505 Walnut Dr', '2020-03-08'),
111     (9, 'Ivy White', '606 Spruce Ct', '2023-06-09'),
112     (10, 'Jack Jones', '707 Fir Blvd', '2024-01-10');
113
114 select * from Customer;
```



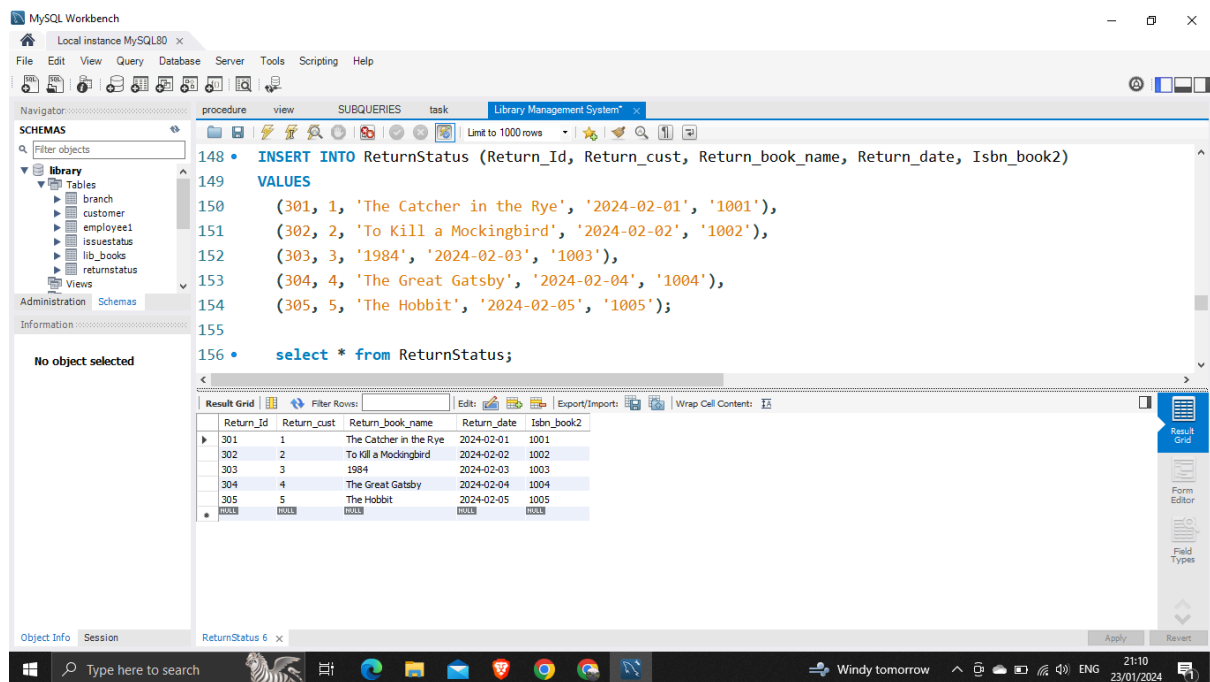
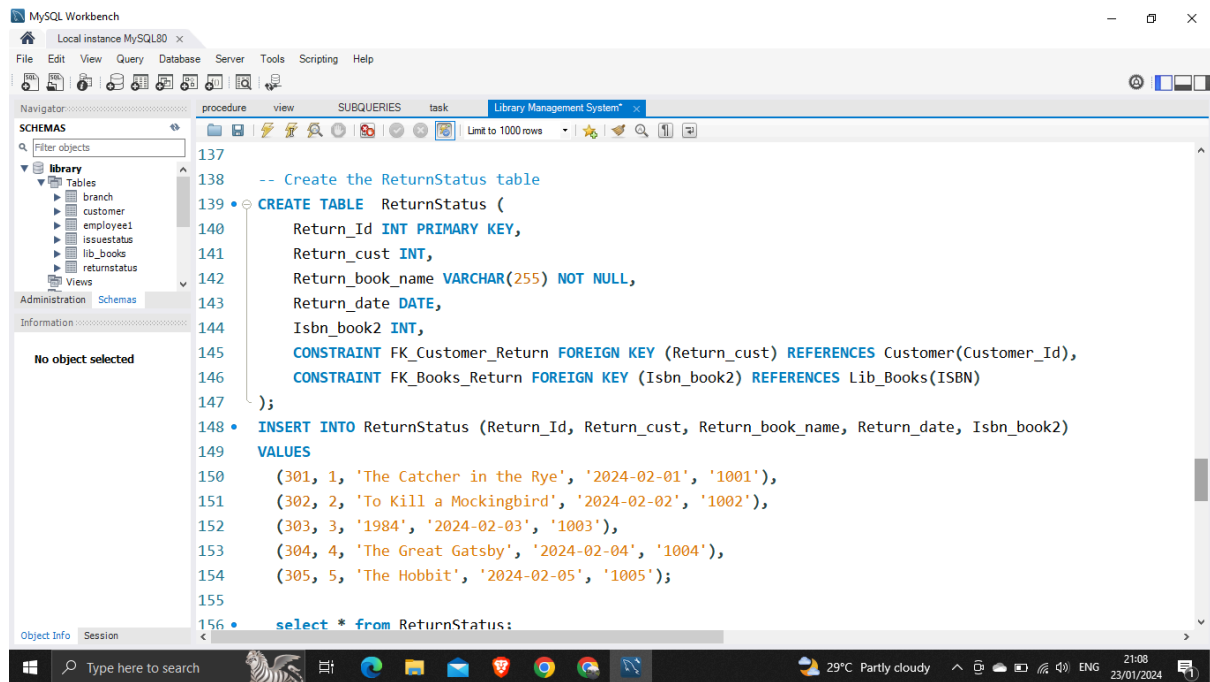
The screenshot shows the MySQL Workbench interface with the 'Result Grid' tab selected. The result grid displays the data inserted into the 'Customer' table. The data is as follows:

Customer_Id	Customer_name	Customer_address	Reg_date
1	Alice Johnson	123 Main St	2021-01-01
2	Bob Smith	456 Oak St	2024-01-02
3	Charlie Brown	789 Pine St	2021-08-03
4	Diana Davis	101 Elm St	2024-01-04
5	Edward Evans	202 Maple Ave	2022-01-05
6	Frank Fisher	303 Birch Ln	2024-06-06
7	Grace Green	404 Cedar Rd	2021-04-07
8	Harry Harris	505 Walnut Dr	2020-03-08
9	Ivy White	606 Spruce Ct	2023-06-09
10	Jack Jones	707 Fir Blvd	2024-01-10

## 5. IssueStatus Table



## 6. ReturnStatus Table



## Queries and Answers

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

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

158  
159  
160 -- 1. Retrieve the book title, category, and rental price of all available books.  
161  
162 • select ISBN,Book\_title, Category, Rental\_Price from Lib\_Books where Status="Yes";  
163  
164  
165

Navigation: Filter objects

SCHEMAS

- lib\_status
- lib\_books
  - Columns
    - ISBN
    - Book\_title
    - Category
    - Rental\_Price
    - Status
    - Author

Administration Schemas

Information

No object selected

Result Grid

ISBN	Book_title	Category	Rental_Price
1001	The Catcher in the Rye	Fiction	3.99
1002	To Kill a Mockingbird	Fiction	4.99
1003	1984	Dystopian	5.99
1005	The Hobbit	Fantasy	6.99
1008	Harry Potter and the Sorcerer's Stone	Fantasy	6.99
1009	The History of Ancient Civilizations	History	12.99

Object Info Session Lib\_Books 8

Apply Revert

Type here to search

Earnings upcoming

19:21 24/01/2024

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



MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHMAS

Filter objects

library

Tables

branch

customer

employee1

issuestatus

lib\_books

returnstatus

Views

Administration Schemas

Information

No object selected

procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

164

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

166

167 • SELECT Emp\_name, Salary from Employee1 order by Salary DESC ;

Result Grid

Emp_name	Salary
Grace Green	65000.00
Megan Miller	65000.00
John Doe	60000.00
Ivy White	60000.00
Quincy Quinn	60000.00
Diana Davis	52000.00
Jack Jones	52000.00
Nathan Nelson	52000.00
Bob Johnson	50000.00
Edward Evans	46000.00
Peter Parker	46000.00
Alice Williams	45000.00
Larry Lee	45000.00
Harry Harris	42000.00
Frank Fisher	41000.00
Rachel Rogers	41000.00
Jane Smith	40000.00
Charlie Brown	40000.00
Karen King	40000.00
Olivia Olson	40000.00

Object Info Session Employee1 8

29°C Partly cloudy 21:19 23/01/2024

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

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHMAS

Filter objects

library

Tables

branch

customer

employee1

issuestatus

lib\_books

returnstatus

Views

Administration Schemas

Information

No object selected

procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

167

168

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

170 • SELECT Customer\_Id, Issued\_book\_name AS Book\_Titles, Customer\_name

171 FROM IssueStatus

172 JOIN Customer ON IssueStatus.Issued\_cust = Customer.Customer\_Id;

173

174

Result Grid

Customer_Id	Book_Titles	Customer_name
1	The Catcher in the Rye	Alice Johnson
2	To Kill a Mockingbird	Bob Smith
3	1984	Charlie Brown
4	The Great Gatsby	Diana Davis
5	The Hobbit	Edward Evans

Object Info Session Result 9

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

The screenshot shows the MySQL Workbench interface with a query editor window titled "Library Management System". The query is as follows:

```

173
174
175
176 -- 4. Display the total count of books in each category.
177
178 • select category,count( Category) AS Total_Count_Of_Books from Lib_Books group by Category;
179
180

```

The result grid shows the following data:

category	Total_Count_Of_Books
Fiction	2
Dystopian	1
Classic	1
Fantasy	2
History	2
Mystery	1
Science Fiction	1

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

The screenshot shows the MySQL Workbench interface with a query editor window titled "Library Management System". The query is as follows:

```

177
178
179 -- 5. Retrieve the employee names and their positions for the employees whose salaries are above Rs.50,000.
180
181 • select Emp_name, Position,Salary from Employee1 where salary>50000;
182
183
184
185

```

The result grid shows the following data:

Emp_name	Position	Salary
John Doe	Manager	60000.00
Diana Davis	Assistant Manager	52000.00
Grace Green	Manager	65000.00
Ivy White	Manager	60000.00
Jack Jones	Assistant Manager	52000.00
Megan Miller	Manager	65000.00
Nathan Nelson	Assistant Manager	52000.00
Quincy Quinn	Manager	60000.00

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

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHMAS

Filter objects

library

- branch
- customer
- employee1
- issuestatus
- lib\_books
- returnstatus
- Views

Administration Schemas

Information

No object selected

procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

185

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

187

188 SELECT Customer\_Id, Customer\_name, Reg\_date

189 FROM Customer

190 WHERE Reg\_date < '2022-01-01'

191 AND Customer\_Id NOT IN (SELECT Issued\_cust FROM IssueStatus);

192

Result Grid

Customer_Id	Customer_name	Reg_date
7	Grace Green	2021-04-07
8	Harry Harris	2020-03-08

Object Info Session Customer 5

29°C Partly cloudy 19:00 24/01/2024

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

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHMAS

Filter objects

library

- branch
- customer
- employee1
- issuestatus
- lib\_books
- returnstatus
- Views

Administration Schemas

Information

No object selected

procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

192

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

194

195 select Branch\_no, COUNT(\*) AS Employees\_in\_each\_branch from Employee1 group by Branch\_no;

196

197

198

199

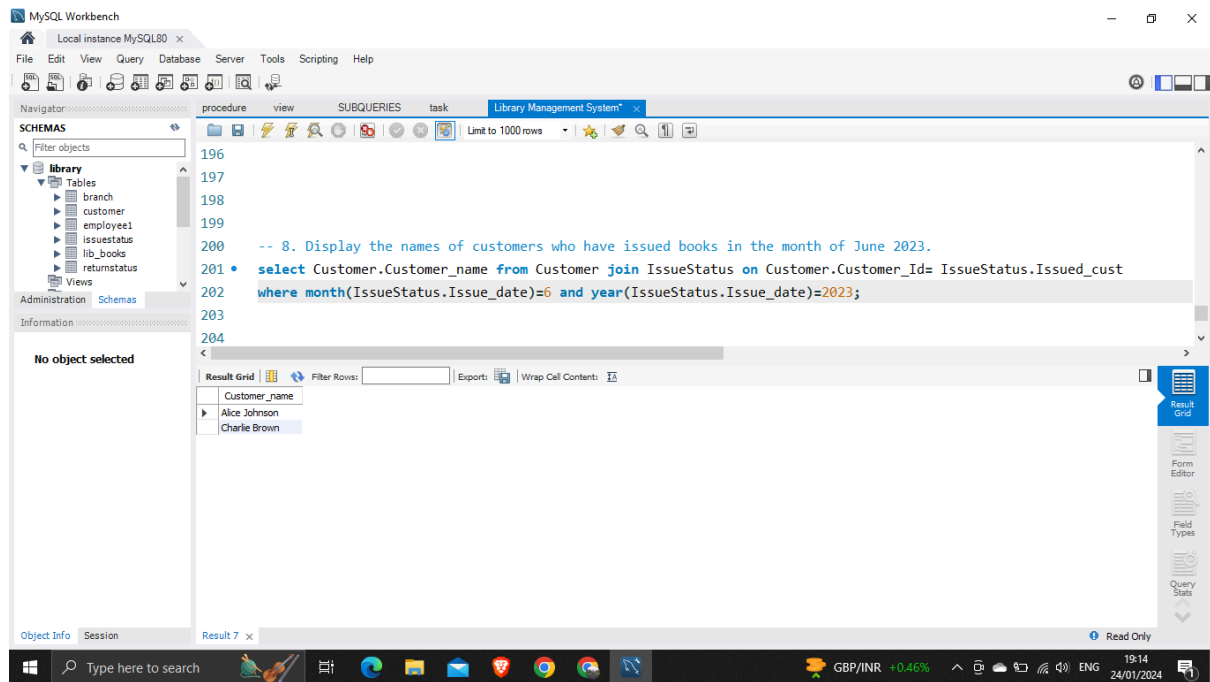
Result Grid

Branch_no	Employees_in_each_branch
1	6
2	2
3	3
4	6
5	3

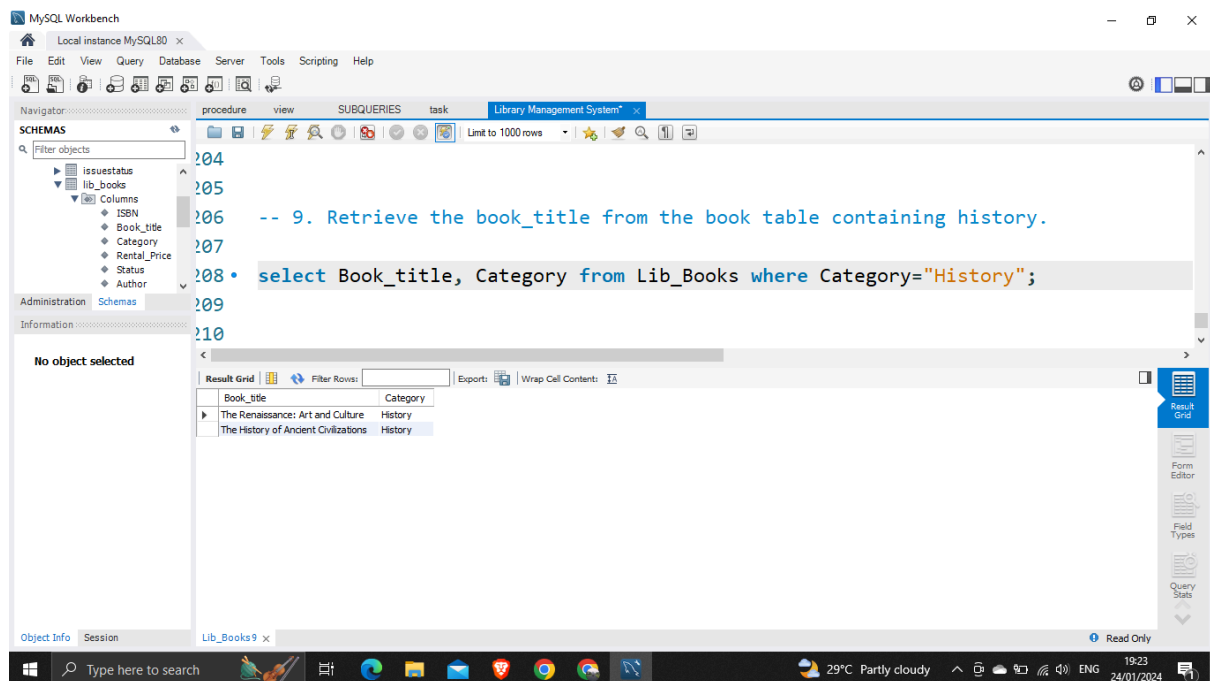
Object Info Session Result 6

29°C Partly cloudy 19:04 24/01/2024

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



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



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 procedure view SUBQUERIES task Library Management System

Limit to 1000 rows

209  
210  
211 -- 10.Retrieve the branch numbers along with the count of employees for branches having more than 5 employees  
212  
213 • select Branch\_no,count(\*) as Count\_of\_Employees from Employee1 GROUP BY Branch\_no  
214 HAVING COUNT(\*) > 5;  
215  
216  
217

SCHEMAS

Filter objects

- issuestatus
- lib\_books
  - Columns
    - ISBN
    - Book\_title
    - Category
    - Rental\_Price
    - Status
    - Author

Administration Schemas

Information

No object selected

Result Grid

Branch_no	Count_of_Employees
1	6
4	6

Object Info Session Result 10 x Read Only

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