

Library Management System

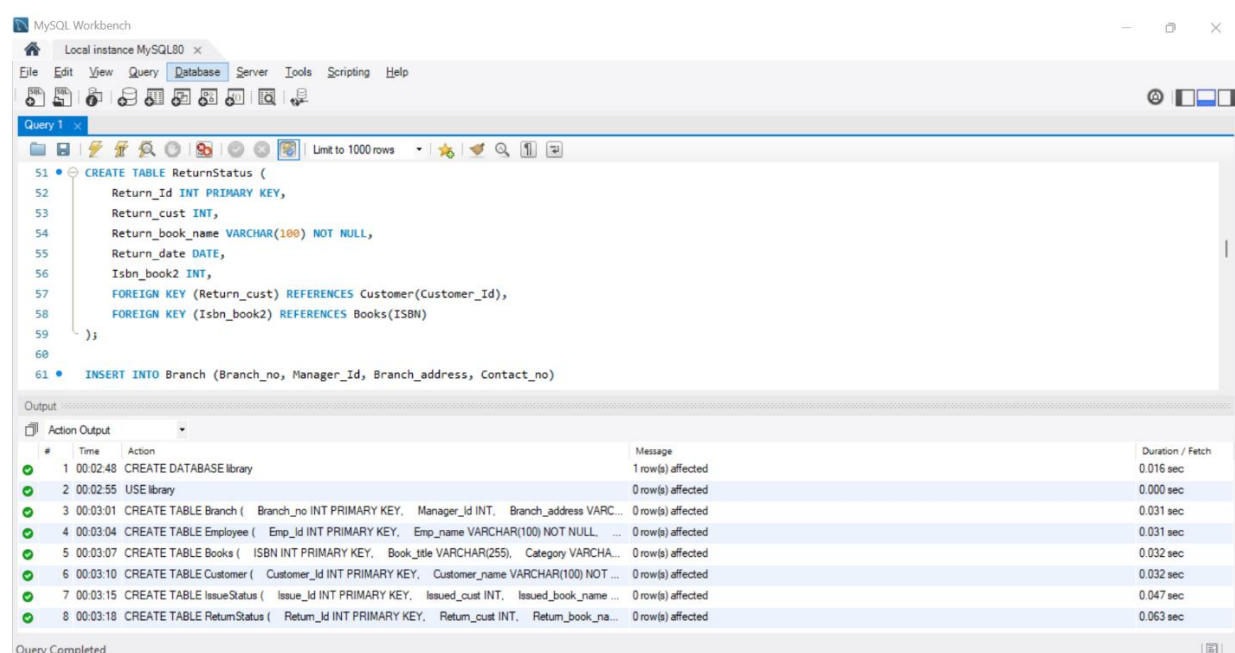
Topic: Library Management System You are going to build a project based on Library Management System.

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

Creating Database and Tables:-



The screenshot shows the MySQL Workbench interface. The 'Query 1' editor contains the following SQL code:

```
51 CREATE TABLE ReturnStatus (  
52     Return_Id INT PRIMARY KEY,  
53     Return_cust INT,  
54     Return_book_name VARCHAR(100) NOT NULL,  
55     Return_date DATE,  
56     Isbn_book2 INT,  
57     FOREIGN KEY (Return_cust) REFERENCES Customer(Customer_Id),  
58     FOREIGN KEY (Isbn_book2) REFERENCES Books(ISBN)  
59 );  
60  
61 INSERT INTO Branch (Branch_no, Manager_Id, Branch_address, Contact_no)
```

The 'Output' pane at the bottom shows the execution results of the queries. The table below represents the data shown in the output:

#	Time	Action	Message	Duration / Fetch
1	00:02:48	CREATE DATABASE library	1 row(s) affected	0.016 sec
2	00:02:55	USE library	0 row(s) affected	0.000 sec
3	00:03:01	CREATE TABLE Branch (Branch_no INT PRIMARY KEY, Manager_Id INT, Branch_address VARC...	0 row(s) affected	0.031 sec
4	00:03:04	CREATE TABLE Employee (Emp_Id INT PRIMARY KEY, Emp_name VARCHAR(100) NOT NULL, ...	0 row(s) affected	0.031 sec
5	00:03:07	CREATE TABLE Books (ISBN INT PRIMARY KEY, Book_title VARCHAR(255), Category VARCHA...	0 row(s) affected	0.032 sec
6	00:03:10	CREATE TABLE Customer (Customer_Id INT PRIMARY KEY, Customer_name VARCHAR(100) NOT ...	0 row(s) affected	0.032 sec
7	00:03:15	CREATE TABLE IssueStatus (Issue_Id INT PRIMARY KEY, Issued_cust INT, Issued_book_name ...	0 row(s) affected	0.047 sec
8	00:03:18	CREATE TABLE ReturnStatus (Return_Id INT PRIMARY KEY, Return_cust INT, Return_book_na...	0 row(s) affected	0.063 sec

Query Completed

Branch Table

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Query 1

```
71 (9, 509, '910 Dogwood Drive', '229-555-1212'),
72 (10, 510, '1200 Oakmont Street', '230-555-9102');
73 select * from Branch;
74
75 INSERT INTO Employee (Emp_Id, Emp_name, Position, Salary, Branch_no)
76 VALUES
77 (991, 'Robert Anderson', 'Manager', 150000, 1),
78 (992, 'Emily Johnson', 'Clerk', 20000, 2),
79 (993, 'Lauren Garcia', 'Assistant Manager', 90000, 3),
80 (994, 'Sarah Davis', 'Librarian', 35000, 4),
81 (995, 'David Miller', 'Clerk', 20500, 5),
82 (996, 'Jessica Wilson', 'Assistant Manager', 85000, 6),
83 (997, 'James Moore', 'Librarian', 40000, 7),
84 (998, 'Ashley Taylor', 'Clerk', 25000, 8),
85 (999, 'John Smith', 'Manager', 100000, 9),
86 (1000, 'Megan Thomas', 'Clerk', 30000, 10),
87 (1001, 'William Jackson', 'Manager', 95000, 6),
88 (1002, 'Jennifer White', 'Assistant Manager', 80500, 6),
89 (1003, 'Christopher Harris', 'Clerk', 31000, 7),
90 (1004, 'Amanda Martin', 'Data Operator', 15000, 1),
91 (1005, 'Matthew Thompson', 'Manager', 105000, 9),
92 (1006, 'Michael Brown', 'Assistant Manager', 80000, 1),
93 (1007, 'Andrew Martinez', 'Clerk', 30500, 1),
94 (1008, 'Nicole Robinson', 'Librarian', 41000, 1),
```

Result Grid

Branch_no	Manager_Id	Branch_address	Contact_no
1	501	111 Redwood Court	221-555-7789
2	502	225 Sycamore Lane	(222) 555-9901
3	503	333 Chestnut Drive	(223) 555-1213
4	504	456 Elm Avenue	224-555-3435
5	505	509 Walnut Avenue	225-555-5657
6	506	672 Hickory Avenue	226-555-7879
7	507	770 Ash Boulevard	227-555-1235
8	508	830 Fir Street	228-555-5566
9	509	910 Dogwood Drive	229-555-1212
10	510	1200 Oakmont Street	230-555-9102

Branch 1

Query Completed

Employee Table

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Query 1

```
90 (1004, 'Amanda Martin', 'Data Operator', 15000, 1),
91 (1005, 'Matthew Thompson', 'Manager', 105000, 9),
92 (1006, 'Michael Brown', 'Assistant Manager', 80000, 1),
93 (1007, 'Andrew Martinez', 'Clerk', 30500, 1),
94 (1008, 'Nicole Robinson', 'Librarian', 41000, 1),
```

Result Grid

Emp_Id	Emp_name	Position	Salary	Branch_no
991	Robert Anderson	Manager	150000.00	1
992	Emily Johnson	Clerk	20000.00	2
993	Lauren Garcia	Assistant Manager	90000.00	3
994	Sarah Davis	Librarian	35000.00	4
995	David Miller	Clerk	20500.00	5
996	Jessica Wilson	Assistant Manager	85000.00	6
997	James Moore	Librarian	40000.00	7
998	Ashley Taylor	Clerk	25000.00	8
999	John Smith	Manager	100000.00	9
1000	Megan Thomas	Clerk	30000.00	10
1001	William Jackson	Manager	95000.00	6
1002	Jennifer White	Assistant Manager	80500.00	6
1003	Christopher Harris	Clerk	31000.00	7
1004	Amanda Martin	Data Operator	15000.00	1
1005	Matthew Thompson	Manager	105000.00	9
1006	Michael Brown	Assistant Manager	80000.00	1
1007	Andrew Martinez	Clerk	30500.00	1
1008	Nicole Robinson	Librarian	41000.00	1

Employee 2

Query Completed

Books Table

MySQL Workbench

Local instance MySQL80

FileEditViewQueryDatabaseServerToolsScriptingHelp

Query 1

Limit to 1000 rows

```
109 ('5509', 'Digital Nomad Life', 'Travel', 685.17, 'yes', 'Brian Williams', 'Wanderlust Press'),
110 ('5510', 'The Art of Photography', 'Arts', 497.17, 'No', 'Julia Benson', 'Visionary Publishing');
111 select * from Books;
112
113 INSERT INTO Customer (Customer_Id, Customer_name, Customer_address, Reg_date)
114 VALUES
115 ('2011', 'Charles Harris', '808 Cedar St', '2023-01-10'),
116 ('2012', 'Amanda Martinez', '909 Oak Ave', '2022-01-05'),
117 ('2013', 'Christopher Lee', '1001 Birch St', '2020-10-05');
```

Result Grid

Filter Rows:

Export/Import:

Wrap Cell Content:

ISBN	Book_title	Category	Rental_Price	Status	Author	Publisher
5501	The Silent Symphony	Fiction	414.17	Yes	Emma Collins	Apex Publishing
5502	Whispers of the Past	Mystery	456.67	Yes	Thomas Rutherford	Crimson House Books
5503	The Quantum Paradox	Science Fiction	581.17	Yes	Linda Brooks	Galaxy Press
5504	Cooking for Beginners	Cookbooks	248.17	No	Sarah Green	Tasteful Editions
5505	Understanding AI	Technology	581.17	Yes	Mark Williams	Tech Publishing Inc
5506	Journey Through Time- History	Historical Fiction	785.27	no	Richard Knight	Legacy Press
5507	The Green Revolution	Non-Fiction	664.17	No	Barbara Scott	EcoReads Publishing
5508	A Dance of Shadows	Fantasy	581.17	Yes	J.K. DeVries	DreamForge Books
5509	Digital Nomad Life	Travel	685.17	yes	Brian Williams	Wanderlust Press
5510	The Art of Photography	Arts	497.17	No	Julia Benson	Visionary Publishing

Books 3

Query Completed

Customer Table

MySQL Workbench

Local instance MySQL80

FileEditViewQueryDatabaseServerToolsScriptingHelp

Query 1

Limit to 1000 rows

```
118 ('2014', 'Jessica Robinson', '1102 Maple Rd', '2024-01-04'),
119 ('2015', 'Daniel Walker', '1203 Pine Blvd', '2024-09-01'),
120 ('2016', 'Olivia Green', '1304 Redwood Ln', '2023-07-09'),
121 ('2017', 'James Young', '1405 Elm St', '2021-04-07'),
122 ('2018', 'Sophia King', '1506 Oak Rd', '2020-05-16'),
123 ('2019', 'Benjamin Wright', '1607 Cedar Blvd', '2023-04-01'),
124 ('2020', 'Natalie Scott', '1708 Willow Ave', '2021-02-10');
125 select * from Customer;
```

Result Grid

Filter Rows:

Export/Import:

Wrap Cell Content:

Customer_Id	Customer_name	Customer_address	Reg_date
2011	Charles Harris	808 Cedar St	2023-01-10
2012	Amanda Martinez	909 Oak Ave	2022-01-05
2013	Christopher Lee	1001 Birch St	2020-10-05
2014	Jessica Robinson	1102 Maple Rd	2024-01-04
2015	Daniel Walker	1203 Pine Blvd	2024-09-01
2016	Olivia Green	1304 Redwood Ln	2023-07-09
2017	James Young	1405 Elm St	2021-04-07
2018	Sophia King	1506 Oak Rd	2020-05-16
2019	Benjamin Wright	1607 Cedar Blvd	2023-04-01
2020	Natalie Scott	1708 Willow Ave	2021-02-10

Customer 4

Query Completed

IssueStatus Table

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Query 1

VALUES
(
'31001', '2014', 'Understanding AI', '2022-10-21'),
(
'31002', '2019', 'The Green Revolution', '2023-07-10'),
(
'31003', '2015', 'The Art of Photography', '2024-09-25'),
(
'31004', '2020', 'The Quantum Paradox', '2023-02-28'),
(
'31005', '2017', 'Whispers of the Past', '2021-08-09'),
(
'31006', '2018', 'Digital Nomad Life', '2023-06-25');
select * from IssueStatus;

Result Grid

Filter Rows:

Issue_Id Issued_cust Issued_book_name Issue_date Isbn_book

31001 2014 Understanding AI 2022-10-21 NULL

31002 2019 The Green Revolution 2023-07-10 NULL

31003 2015 The Art of Photography 2024-09-25 NULL

31004 2020 The Quantum Paradox 2023-02-28 NULL

31005 2017 Whispers of the Past 2021-08-09 NULL

31006 2018 Digital Nomad Life 2023-06-25 NULL

IssueStatus 5

Query Completed

ReturnStatus Table

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Query 1

INSERT INTO ReturnStatus (Return_Id, Return_cust, Return_book_name, Return_date, Isbn_book2)
VALUES
(
'91001', '2014', 'Understanding AI', '2022-12-25', '5505'),
(
'91002', '2019', 'The Green Revolution', '2023-10-01', '5507'),
(
'91003', '2015', 'The Art of Photography', '2024-11-30', '5510'),
(
'91004', '2020', 'The Quantum Paradox', '2023-05-28', '5503'),
(
'91005', '2017', 'Whispers of the Past', '2021-09-29', '5502');
select * from ReturnStatus;

Result Grid

Filter Rows:

Return_Id Return_cust Return_book_name Return_date Isbn_book2

91001 2014 Understanding AI 2022-12-25 5505

91002 2019 The Green Revolution 2023-10-01 5507

91003 2015 The Art of Photography 2024-11-30 5510

91004 2020 The Quantum Paradox 2023-05-28 5503

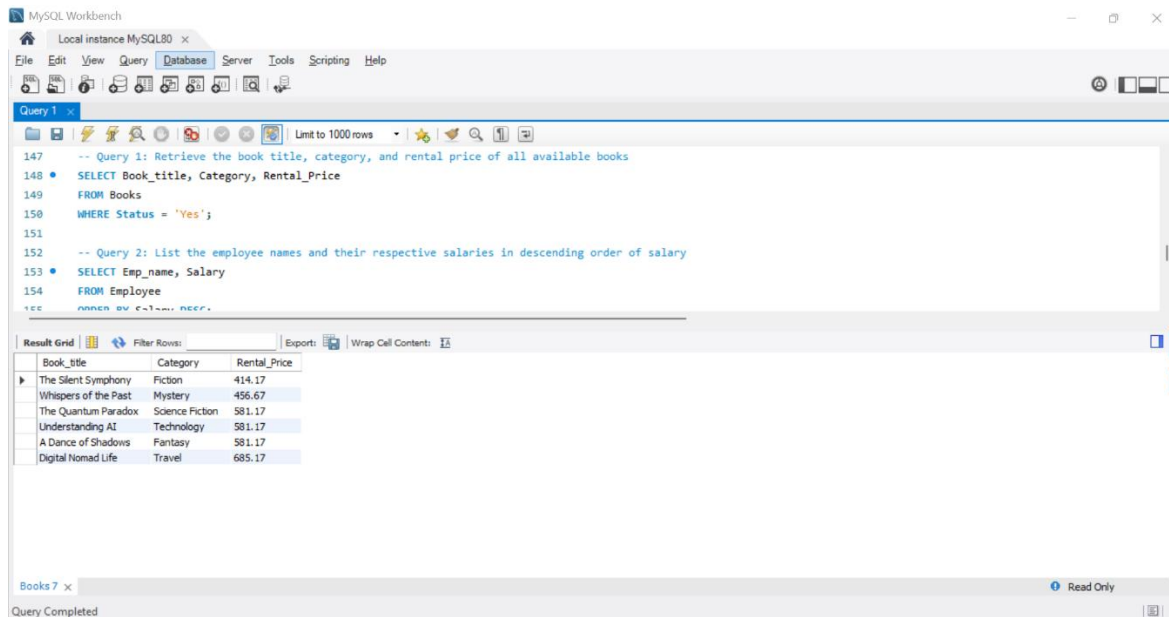
91005 2017 Whispers of the Past 2021-09-29 5502

ReturnStatus 6

Query Completed

Answers for the Queries

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



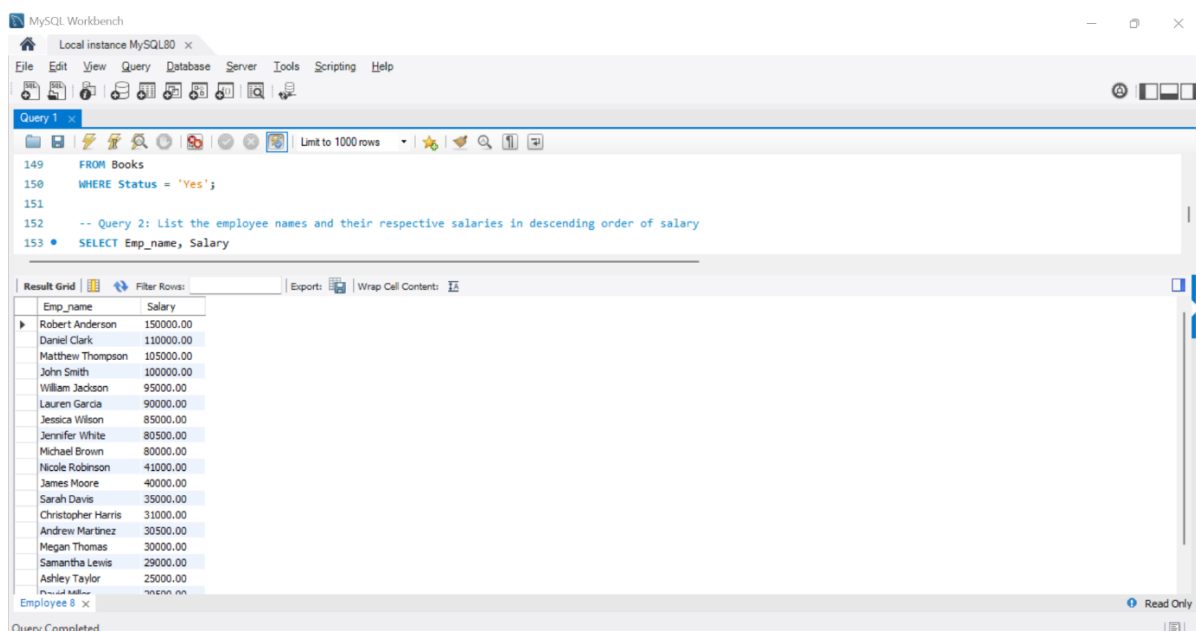
The screenshot shows the MySQL Workbench interface. The 'Query' tab is active, displaying two queries. Query 1 is selected and executed, showing its results in the 'Result Grid' tab. The query is: `-- Query 1: Retrieve the book title, category, and rental price of all available books`
`SELECT Book_title, Category, Rental_Price`
`FROM Books`
`WHERE Status = 'Yes';`

The 'Result Grid' tab shows the following data:

Book_title	Category	Rental_Price
The Silent Symphony	Fiction	414.17
Whispers of the Past	Mystery	456.67
The Quantum Paradox	Science Fiction	581.17
Understanding AI	Technology	581.17
A Dance of Shadows	Fantasy	581.17
Digital Nomad Life	Travel	685.17

The status bar at the bottom indicates 'Query Completed'.

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



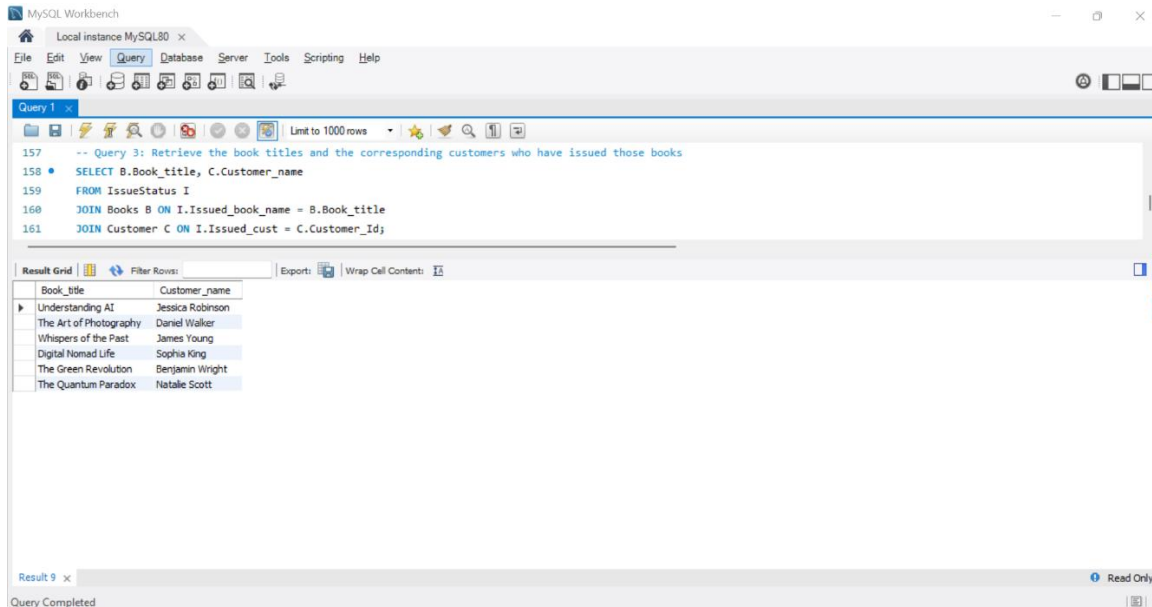
The screenshot shows the MySQL Workbench interface. The 'Query' tab is active, displaying two queries. Query 2 is selected and executed, showing its results in the 'Result Grid' tab. The query is: `-- Query 2: List the employee names and their respective salaries in descending order of salary`
`SELECT Emp_name, Salary`

The 'Result Grid' tab shows the following data:

Emp_name	Salary
Robert Anderson	150000.00
Daniel Clark	110000.00
Matthew Thompson	105000.00
John Smith	100000.00
William Jackson	95000.00
Lauren Garcia	90000.00
Jessica Wilson	85000.00
Jennifer White	80500.00
Michael Brown	80000.00
Nicole Robinson	41000.00
James Moore	40000.00
Sarah Davis	35000.00
Christopher Harris	31000.00
Andrew Martinez	30500.00
Megan Thomas	30000.00
Samantha Lewis	29000.00
Ashley Taylor	25000.00

The status bar at the bottom indicates 'Query Completed'.

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



The screenshot shows the MySQL Workbench interface with a query window open. The query is as follows:

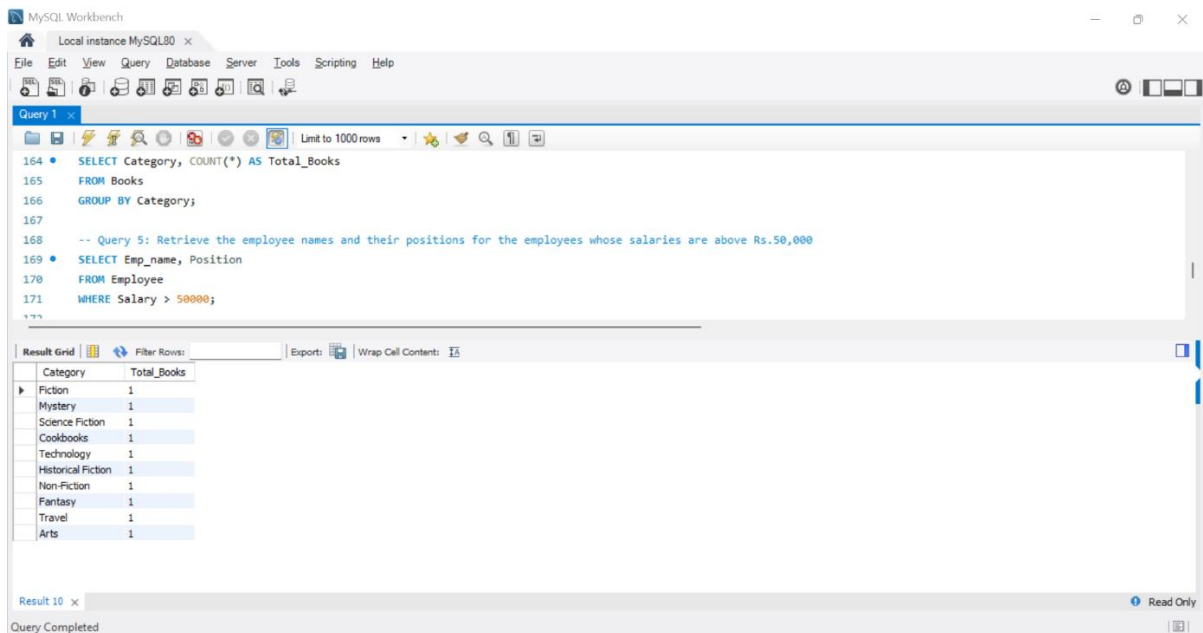
```
-- Query 3: Retrieve the book titles and the corresponding customers who have issued those books
157
158 • SELECT B.Book_title, C.Customer_name
159   FROM IssueStatus I
160  JOIN Books B ON I.Issued_book_name = B.Book_title
161  JOIN Customer C ON I.Issued_cust = C.Customer_Id;
```

The result grid displays the following data:

Book_title	Customer_name
Understanding AI	Jessica Robinson
The Art of Photography	Daniel Walker
Whispers of the Past	James Young
Digital Nomad Life	Sophia King
The Green Revolution	Benjamin Wright
The Quantum Paradox	Natalie Scott

Query Completed

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



The screenshot shows the MySQL Workbench interface with a query window open. The query is as follows:

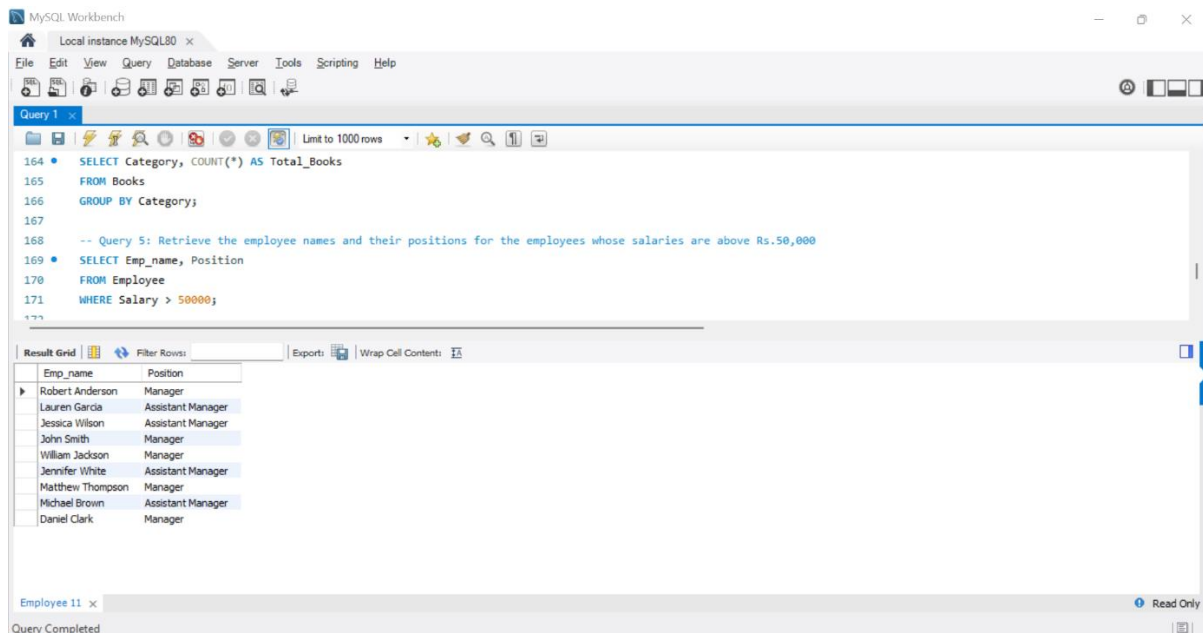
```
164 • SELECT Category, COUNT(*) AS Total_Books
165   FROM Books
166  GROUP BY Category;
167
-- Query 5: Retrieve the employee names and their positions for the employees whose salaries are above Rs.50,000
168
169 • SELECT Emp_name, Position
170   FROM Employee
171  WHERE Salary > 50000;
```

The result grid displays the following data:

Category	Total_Books
Fiction	1
Mystery	1
Science Fiction	1
Cookbooks	1
Technology	1
Historical Fiction	1
Non-Fiction	1
Fantasy	1
Travel	1
Arts	1

Query Completed

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. The query editor contains the following SQL code:

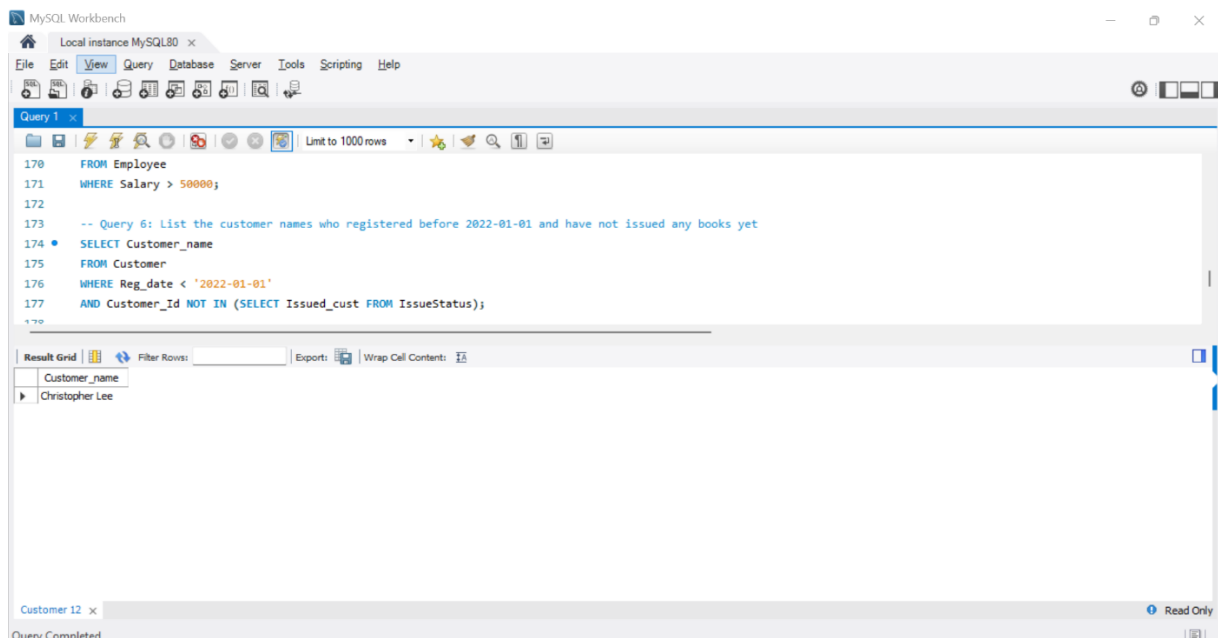
```
164 • SELECT Category, COUNT(*) AS Total_Books
165 FROM Books
166 GROUP BY Category;
167
168 -- Query 5: Retrieve the employee names and their positions for the employees whose salaries are above Rs.50,000
169 • SELECT Emp_name, Position
170 FROM Employee
171 WHERE Salary > 50000;
```

The Result Grid shows the following data:

Emp_name	Position
Robert Anderson	Manager
Lauren Garcia	Assistant Manager
Jessica Wilson	Assistant Manager
John Smith	Manager
William Jackson	Manager
Jennifer White	Assistant Manager
Matthew Thompson	Manager
Michael Brown	Assistant Manager
Daniel Clark	Manager

The status bar at the bottom indicates "Query Completed" and "Employee 11 x".

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



The screenshot shows the MySQL Workbench interface. The query editor contains the following SQL code:

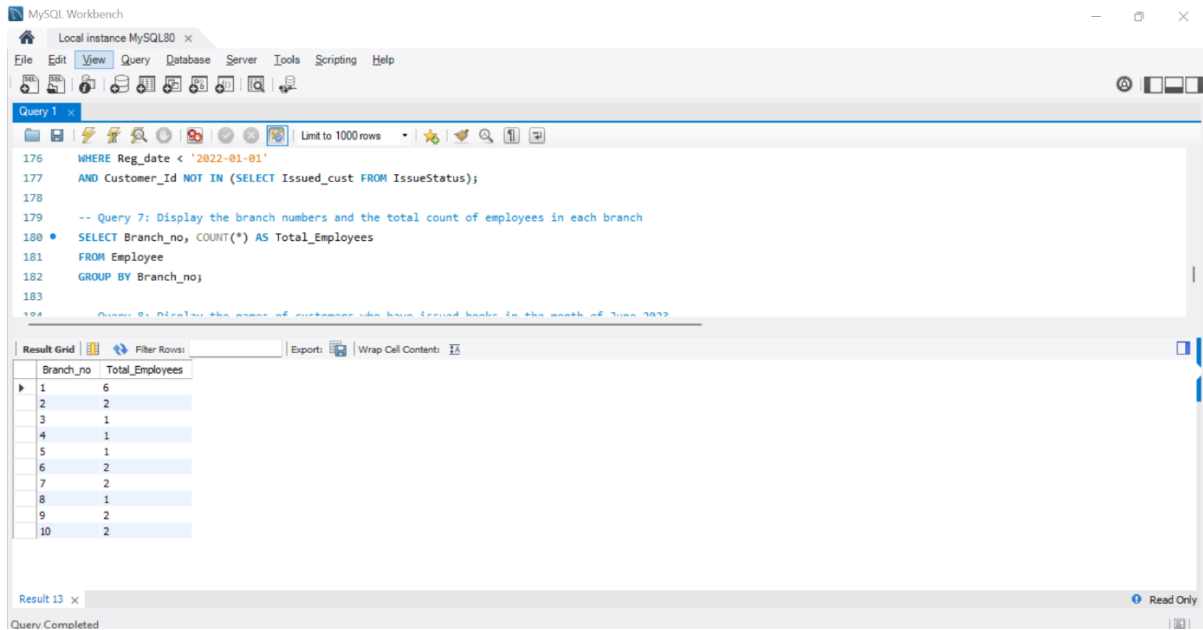
```
170 FROM Employee
171 WHERE Salary > 50000;
172
173 -- Query 6: List the customer names who registered before 2022-01-01 and have not issued any books yet
174 • SELECT Customer_name
175 FROM Customer
176 WHERE Reg_date < '2022-01-01'
177 AND Customer_Id NOT IN (SELECT Issued_cust FROM IssueStatus);
```

The Result Grid shows the following data:

Customer_name
Christopher Lee

The status bar at the bottom indicates "Query Completed" and "Customer 12 x".

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



The screenshot shows the MySQL Workbench interface with a query editor and a result grid. The query editor contains the following SQL code:

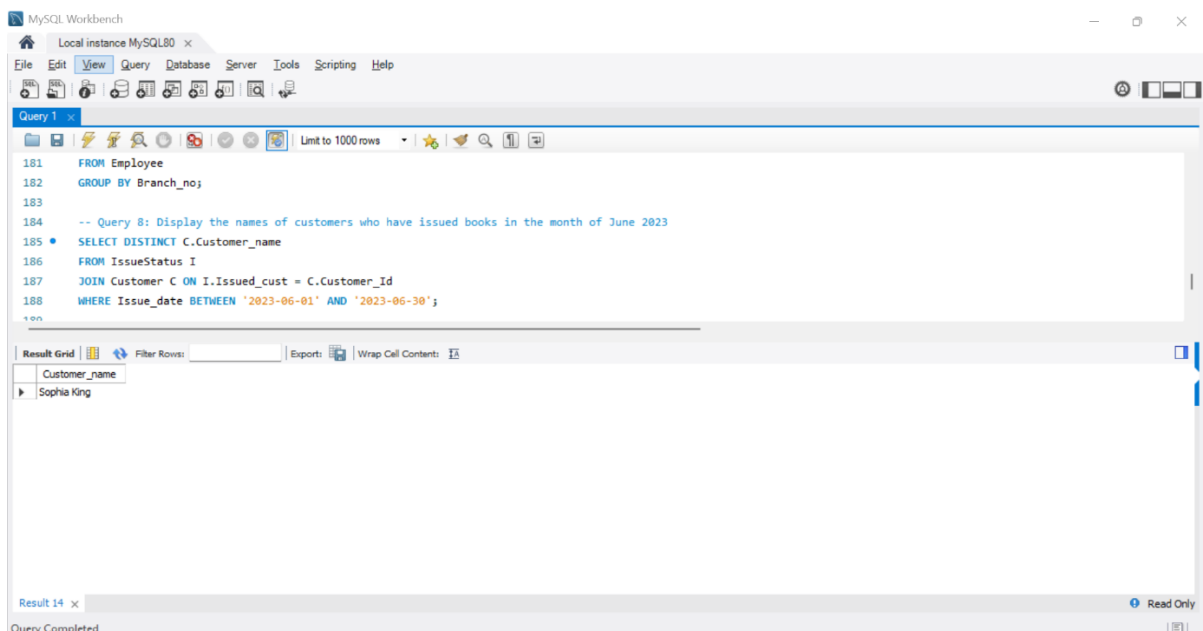
```
176 WHERE Reg_date < '2022-01-01'
177 AND Customer_Id NOT IN (SELECT Issued_cust FROM IssueStatus);
178
179 -- Query 7: Display the branch numbers and the total count of employees in each branch
180 • SELECT Branch_no, COUNT(*) AS Total_Employees
181 FROM Employee
182 GROUP BY Branch_no;
183
184 -- Query 8: Display the names of customers who have issued books in the month of June 2023
```

The result grid displays the following data:

Branch_no	Total_Employees
1	6
2	2
3	1
4	1
5	1
6	2
7	2
8	1
9	2
10	2

The status bar at the bottom indicates "Result 13 x" and "Query Completed".

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 and a result grid. The query editor contains the following SQL code:

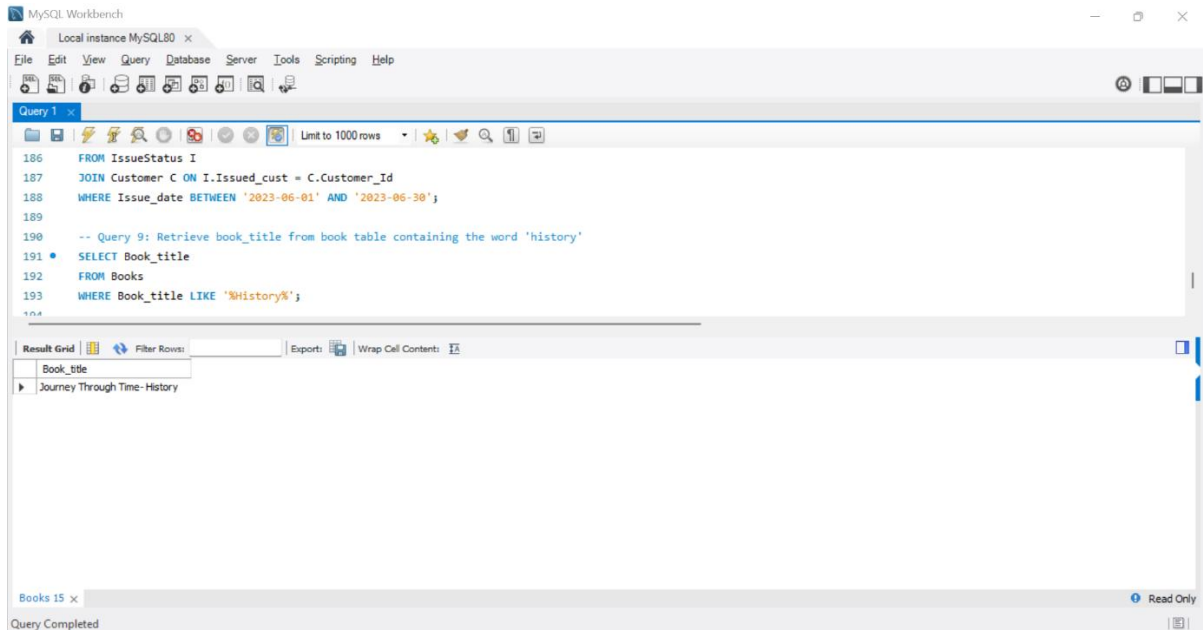
```
181 FROM Employee
182 GROUP BY Branch_no;
183
184 -- Query 8: Display the names of customers who have issued books in the month of June 2023
185 • SELECT DISTINCT C.Customer_name
186 FROM IssueStatus I
187 JOIN Customer C ON I.Issued_cust = C.Customer_Id
188 WHERE Issue_date BETWEEN '2023-06-01' AND '2023-06-30';
189
```

The result grid displays the following data:

Customer_name
Sophia King

The status bar at the bottom indicates "Result 14 x" and "Query Completed".

9. Retrieve book_title from book table containing history.



The screenshot shows the MySQL Workbench interface. The query editor contains the following SQL code:

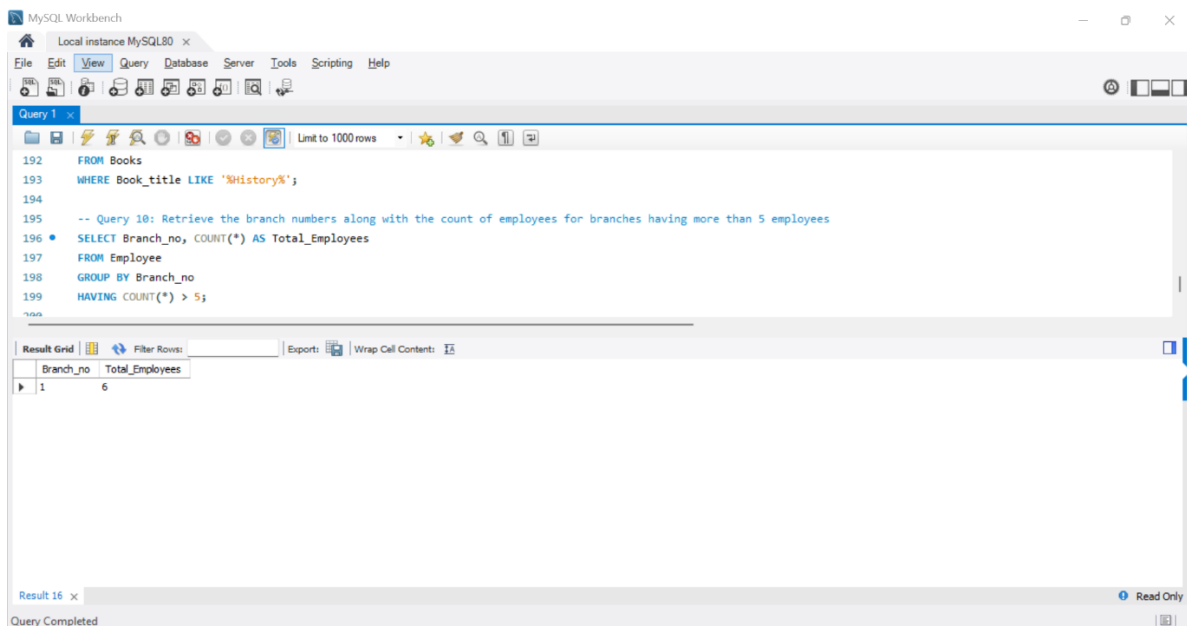
```
186 FROM IssueStatus I
187 JOIN Customer C ON I.Issued_cust = C.Customer_Id
188 WHERE Issue_date BETWEEN '2023-06-01' AND '2023-06-30';
189
190 -- Query 9: Retrieve book_title from book table containing the word 'history'
191 SELECT Book_title
192 FROM Books
193 WHERE Book_title LIKE '%History%';
194
```

The Result Grid shows the following data:

Book_title
Journey Through Time-History

The status bar at the bottom indicates "Query Completed".

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



The screenshot shows the MySQL Workbench interface. The query editor contains the following SQL code:

```
192 FROM Books
193 WHERE Book_title LIKE '%History%';
194
195 -- Query 10: Retrieve the branch numbers along with the count of employees for branches having more than 5 employees
196 SELECT Branch_no, COUNT(*) AS Total_Employees
197 FROM Employee
198 GROUP BY Branch_no
199 HAVING COUNT(*) > 5;
200
```

The Result Grid shows the following data:

Branch_no	Total_Employees
1	6

The status bar at the bottom indicates "Query Completed".

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

The screenshot shows the MySQL Workbench interface with a query window containing the following SQL code:

```
197 FROM Employee
198 GROUP BY Branch_no
199 HAVING COUNT(*) > 5;
200
201 -- Query 11: Retrieve the names of employees who manage branches and their respective branch addresses
202 • SELECT E.Emp_name, B.Branch_address
203 FROM Employee E
204 JOIN Branch B ON E.Emp_Id = B.Manager_Id;
```

The interface includes a toolbar with icons for query execution, a 'Limit to 1000 rows' dropdown, and a 'Result Grid' tab. The 'Output' pane at the bottom shows a log of database actions and their durations.

#	Time	Action	Message	Duration / Fetch
26	00:10:35	SELECT Emp_name, Position FROM Employee WHERE Salary > 50000 LIMIT 0, 1000	9 row(s) returned	0.016 sec / 0.000 sec
27	00:11:06	SELECT Customer_name FROM Customer WHERE Reg_date < '2022-01-01' AND Customer_Id NOT IN (SELECT Customer_Id FROM IssueStatus)	1 row(s) returned	0.000 sec / 0.000 sec
28	00:11:34	SELECT Branch_no, COUNT(*) AS Total_Employees FROM Employee GROUP BY Branch_no LIMIT 0, ...	10 row(s) returned	0.000 sec / 0.000 sec
29	00:12:00	SELECT DISTINCT C.Customer_name FROM IssueStatus I JOIN Customer C ON I.Issued_cust = C.Customer_Id	1 row(s) returned	0.000 sec / 0.000 sec
30	00:12:31	SELECT Book_title FROM Books WHERE Book_title LIKE '%History%'; LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec
31	00:12:56	SELECT Branch_no, COUNT(*) AS Total_Employees FROM Employee GROUP BY Branch_no HAVING COUNT(*) > 5	1 row(s) returned	0.000 sec / 0.000 sec
32	00:13:18	SELECT E.Emp_name, B.Branch_address FROM Employee E JOIN Branch B ON E.Emp_Id = B.Manager_Id	0 row(s) returned	0.000 sec / 0.000 sec

Query Completed

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

The screenshot shows the MySQL Workbench interface with a query window containing the following SQL code:

```
205
206
207 -- Query 12: Display the names of customers who have issued books with a rental price higher than Rs. 25
208 • SELECT DISTINCT C.Customer_name
209 FROM IssueStatus I
210 JOIN Books B ON I.Issued_book_name = B.Book_title
211 JOIN Customer C ON I.Issued_cust = C.Customer_Id
212 WHERE B.Rental_Price > 25;
213
```

The interface includes a toolbar with icons for query execution, a 'Limit to 1000 rows' dropdown, and a 'Result Grid' tab. The 'Result Grid' is currently selected, displaying the following data:

Customer_name
Jessica Robinson
Daniel Walker
James Young
Sophia King
Benjamin Wright
Natalie Scott

Result 18 x

Query Completed