Task 1

Project Title: Library Management System (using SQL)

Project Description:

Design and develop a Library Management System using SQL. The project should involve three tables: Books, Members, BorrowingRecords. The system will manage book inventories, member details, and borrowing transactions.

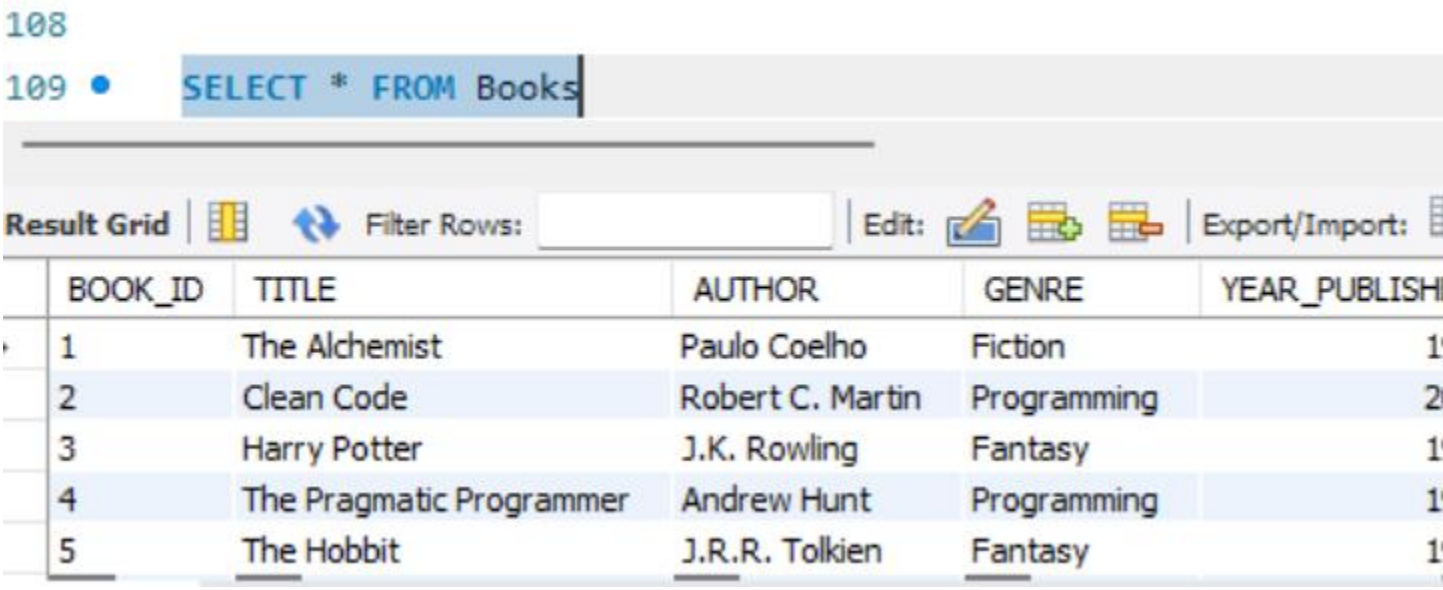
The project will include the following tasks: Database Creation:

a) Create Books table with columns BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_COPIES.

b) Create Members table with columns MEMBER_ID, NAME, EMAIL, PHONE_NO, ADDRESS, MEMBERSHIP_DATE.

c) Create BorrowingRecords table with columns BORROW_ID, MEMBER_ID, BOOK_ID, BORROW_DATE, RETURN_DATE. Set foreign key constraints linking MEMBER_ID to Members and BOOK_ID to Books.

Data Creation: Insert sample data into all three tables.



BOOK_ID	TITLE	AUTHOR	GENRE	YEAR_PUBLISH
1	The Alchemist	Paulo Coelho	Fiction	1
2	Clean Code	Robert C. Martin	Programming	2
3	Harry Potter	J.K. Rowling	Fantasy	1
4	The Pragmatic Programmer	Andrew Hunt	Programming	1
5	The Hobbit	J.R.R. Tolkien	Fantasy	1

```
110  SELECT * FROM Members;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

MEMBER_ID	NAME	EMAIL	PHONE_NO	ADDRESS
1	Monish R	monish@example.com	9876543210	123 Street, City
2	Alice Smith	alice@example.com	9123456780	456 Avenue, City
3	Bob Johnson	bob@example.com	9988776655	789 Road, City
4	Carol Davis	carol@example.com	9012345678	321 Lane, City
NULL	NULL	NULL	NULL	NULL

```
111  SELECT * FROM BorrowingRecords;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

BORROW_ID	MEMBER_ID	BOOK_ID	BORROW_DATE	RETURN_DATE
1	1	1	2025-07-01	2025-07-10
2	1	2	2025-07-15	NULL
3	2	3	2025-08-01	2025-08-15
4	2	4	2025-08-05	NULL
5	3	5	2025-06-20	2025-07-05

BorrowingRecords 12

Information Retrieval:

a) Retrieve a list of books currently borrowed by a specific member.

```
55
56 •  SELECT b.TITLE, b.AUTHOR, br.BORROW_DATE
57     FROM BorrowingRecords br
58     JOIN Books b ON br.BOOK_ID = b.BOOK_ID
59     WHERE br.MEMBER_ID = 1 AND br.RETURN_DATE IS NULL;
```

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

TITLE	AUTHOR	BORROW_DATE
Clean Code	Robert C. Martin	2025-07-15

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b) Find members who have overdue books (borrowed more than 30 days ago, not returned).

```
60
61 •  SELECT m.NAME, m.EMAIL, b.TITLE, br.BORROW_DATE
62     FROM BorrowingRecords br
63     JOIN Members m ON br.MEMBER_ID = m.MEMBER_ID
64     JOIN Books b ON br.BOOK_ID = b.BOOK_ID
65     WHERE br.RETURN_DATE IS NULL
66       AND br.BORROW_DATE < CURDATE() - INTERVAL 30 DAY;
```

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

NAME	EMAIL	TITLE	BORROW_DATE
Monish R	monish@example.com	Clean Code	2025-07-15

---

c) Retrieve books by genre along with the count of available copies.

```
67
68 •   SELECT GENRE, COUNT(*) AS Total_Books, SUM(AVAILABLE_COPIES
69     FROM Books
70     GROUP BY GENRE;
```

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

GENRE	Total_Books	Total_Available
Fiction	1	5
Programming	2	7
Fantasy	2	12

d) Find the most borrowed book(s) overall.

```
71
72 •   SELECT b.TITLE, b.AUTHOR, COUNT(*) AS Borrow_Count
73     FROM BorrowingRecords br
74     JOIN Books b ON br.BOOK_ID = b.BOOK_ID
75     GROUP BY br.BOOK_ID
76     ORDER BY Borrow_Count DESC
77     LIMIT 1;
```

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

TITLE	AUTHOR	Borrow_Count
The Alchemist	Paulo Coelho	2

e) Retrieve members who have borrowed books from at least three different genres.

```
78
79 •  SELECT m.NAME, COUNT(DISTINCT b.GENRE) AS Genre_Count
80     FROM BorrowingRecords br
81     JOIN Members m ON br.MEMBER_ID = m.MEMBER_ID
82     JOIN Books b ON br.BOOK_ID = b.BOOK_ID
83     GROUP BY br.MEMBER_ID
84     HAVING Genre_Count >= 3;
```

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

NAME	Genre_Count

Result Grid

Result 5 ×

Read On

Output

Action Output

#	Time	Action	Message
11	15:36:31	SELECT GENRE, COUNT(*) AS Total_Books, SUM(AVAILABLE_COPIES) AS Tot...	3 row(s) returned
12	15:37:10	SELECT b.TITLE, b.AUTHOR, COUNT(*) AS Borrow_Count FROM BorrowingRec...	1 row(s) returned
13	15:37:42	SELECT m.NAME, COUNT(DISTINCT b.GENRE) AS Genre_Count FROM Borrowi...	0 row(s) returned

Reporting and Analytics:

a) Calculate the total number of books borrowed per month.

```
85
86 •  SELECT DATE_FORMAT(BORROW_DATE, '%Y-%m') AS Borrow_Month, CO
87     FROM BorrowingRecords
88     GROUP BY Borrow_Month
89     ORDER BY Borrow_Month;
```

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

Borrow_Month	Total_Borrowed
2025-06	1
2025-07	2
2025-08	3

b) Find the top three most active members based on the number of books borrowed.

```
90
91 •  SELECT m.NAME, COUNT(*) AS Books_Borrowed
92     FROM BorrowingRecords br
93     JOIN Members m ON br.MEMBER_ID = m.MEMBER_ID
94     GROUP BY br.MEMBER_ID
95     ORDER BY Books_Borrowed DESC
96     LIMIT 3;
```

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

NAME	Books_Borrowed
Monish R	2
Alice Smith	2
Bob Johnson	1

c) Retrieve authors whose books have been borrowed at least 10 times.

```
97
98 •  SELECT b.AUTHOR, COUNT(*) AS Borrow_Count
99    FROM BorrowingRecords br
100   JOIN Books b ON br.BOOK_ID = b.BOOK_ID
101   GROUP BY b.AUTHOR
102   HAVING Borrow_Count >= 10;
```

manually get help for th
current caret position or
toggle automatic help.

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

AUTHOR	Borrow_Count

Result Grid

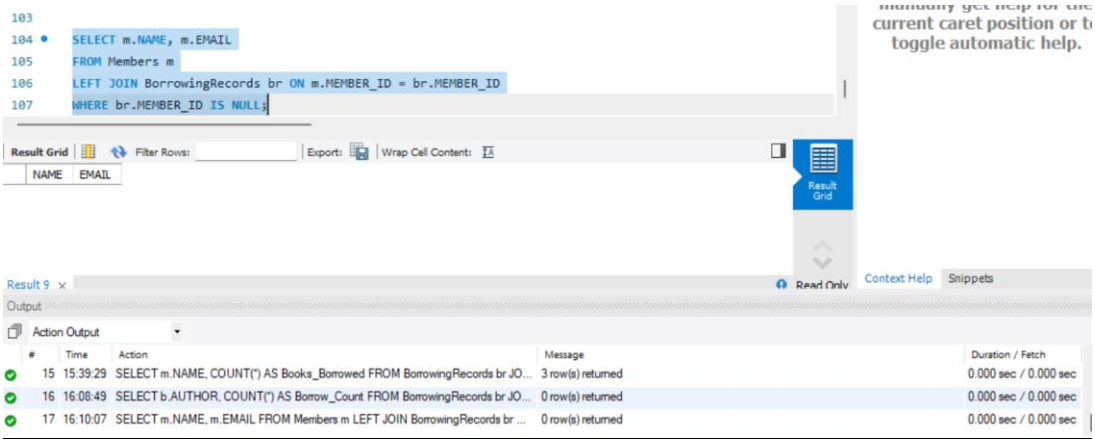
Result 8 | Read Only | Context Help | Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
14	15:38:55	SELECT DATE_FORMAT(BORROW_DATE, '%Y-%m') AS Borrow_Month, COUNT...	3 row(s) returned	0.015 sec / 0.000 sec
15	15:39:29	SELECT m.NAME, COUNT(*) AS Books_Borrowed FROM BorrowingRecords br JO...	3 row(s) returned	0.000 sec / 0.000 sec
16	16:08:49	SELECT b.AUTHOR, COUNT(*) AS Borrow_Count FROM BorrowingRecords br JO...	0 row(s) returned	0.000 sec / 0.000 sec

d) Identify members who have never borrowed a book.


103
104 • SELECT m.NAME, m.EMAIL
105 FROM Members m
106 LEFT JOIN BorrowingRecords br ON m.MEMBER_ID = br.MEMBER_ID
107 WHERE br.MEMBER_ID IS NULL;
current caret position or t
toggle automatic help.
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
NAME
EMAIL
Result Grid
Read Only
Context Help
Snippets
Result 9
Output
Action Output
Time Action Message Duration / Fetch
15 15:39:29 SELECT m.NAME, COUNT(*) AS Books_Borrowed FROM BorrowingRecords br JO... 3 row(s) returned 0.000 sec / 0.000 sec
16 16:08:49 SELECT b.AUTHOR, COUNT(*) AS Borrow_Count FROM BorrowingRecords br JO... 0 row(s) returned 0.000 sec / 0.000 sec
17 16:10:07 SELECT m.NAME, m.EMAIL FROM Members m LEFT JOIN BorrowingRecords br ... 0 row(s) returned 0.000 sec / 0.000 sec