HackathonSubmissionTemplate(Level-2-Solution)

UseCaseTitle:[LibraryBookBorrowingandManagement]

StudentName:[POORNIMA S]

RegisterNumber:[U22CSE32220]

Institution:[SRI MEENAKSHI GOVT ARTS COLLEGE FOR WOMEN MADURAI]

Department:[COMPUTER SCIENCE]

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1. ProblemStatement

This library management system aims to solve the basic challenge of tracking booksandborrowers.Manualtrackingofbookloansandreturnsistime-consuming and error-prone, so this system will help librarians keep accurate records of the library's collection and borrowing activities.

2. DatabaseDesign&Implementation

DatabaseCreation&Tables

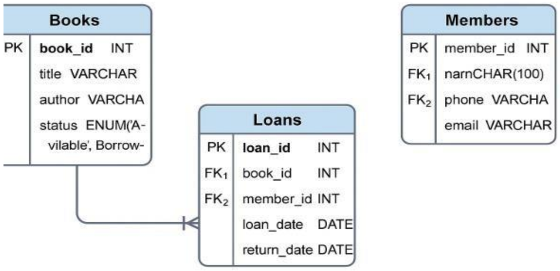
```
--Createdatabase
CREATEDATABASElibrary;
USE library;

-- Create Books table
CREATETABLEBooks(
   book_idINTPRIMARYKEYAUTO_INCREMENT, title
   VARCHAR(100) NOT NULL,
   authorVARCHAR(50)NOTNULL,
   statusENUM('Available','Borrowed')DEFAULT'Available'
);
```

```
-- Create Members table
CREATETABLEMembers(
    member_id INTPRIMARYKEYAUTO_INCREMENT,
    name VARCHAR(100) NOT NULL,
    phoneVARCHAR(20),
    emailVARCHAR(100)
);

-- Create Loans table
CREATETABLELoans(
    loan_idINTPRIMARYKEYAUTO_INCREMENT,
    book_id INT,
    member_idINT,
    loan_dateDATENOTNULL,
    return_date DATE
);
```

ERDiagram(ReverseEngineered)



3. QueriesforDataManagement

InsertSampleData

```
INSERT INTO Members (name, phone, email) VALUES
('John Doe', '9876543210', 'john.doe@example.com'),('Alice
Smith', '8765432109', 'alice.smith@example.com'),
('BobJohnson','7654321098','bob.johnson@example.com'),
('Emily Davis', '6543210987', 'emily.davis@example.com'),
('MichaelBrown','5432109876','michael.brown@example.com');

INSERTINTOLoans(book_id,member_id,loan_date,return_date)VALUES
```

```
(3,1,'2025-04-01',NULL),--Bookborrowed,notyetreturned (5, 2,
'2025-03-28', '2025-04-03'),
(1,3,'2025-03-30',NULL),--Bookborrowed,notyetreturned (4, 4,
'2025-03-25', '2025-03-31');
```

RetrievalQueries

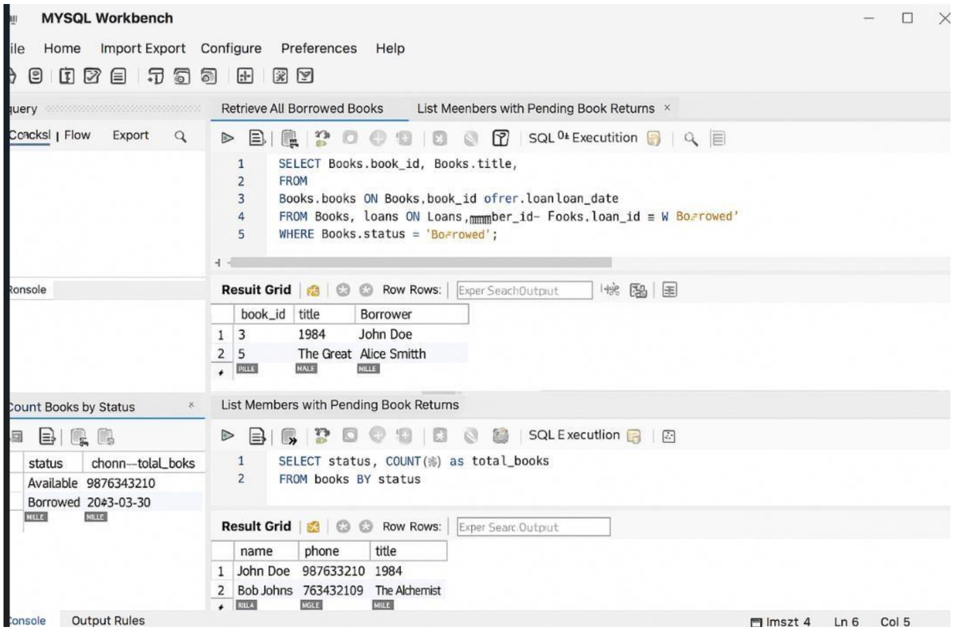
```
SELECTBooks.book_id,Books.title,Members.nameASBorrower, Loans.loan_dateb
FROMBooks
JOINLoansONBooks.book_id=Loans.book_id
JOIN Members ON Loans.member_id = Members.member_id
WHEREBooks.status='Borrowed';4.Implementation&Results
```

ExecutionEnvironment

TheLibraryManagementSystemwasimplementedandexecutedin MySQL Workbench.

- DatabaseManagementSystem(DBMS):MySQL8.0
- ExecutionPlatform:MySQLWorkbench8.0
- OperatingSystem:Windows11
- TestingData:Samplebooks,members,andloanswereinsertedtovalidate queries.
- ToolsUsed:
    - MySQLWorkbench(fordatabasecreation,queryexecution,andER diagram generation)

ScreenshotsofExecutionResults



```
SELECT Books.book_id, Books.title,
FROM
Books.books ON Books.book_id ofrer.loanloan_date
FROM Books, loans ON Loans,mmmber_id- Fooks.loan_id ≡ W Bo≠rowed'
WHERE Books.status = 'Bo≠rowed';
```

	book_id	title	Borrower
1	3	1984	John Doe
2	5	The Great	Alice Smitth

status	chonn--tolal_boks
Available	9876343210
Borrowed	20#3-03-30

```
SELECT status, COUNT(*) as total_books
FROM books BY status
```

	name	phone	title
1	John Doe	987633210	1984
2	Bob Johns	763432109	The Alchemist

5. GitHubRepository

Repository Link

https://github.com/poorni5/Poornima_5419EE60C2C270C9FED400790122633F

UploadedFilesinRepository

SQL-Scripts

https://github.com/poorni5/Poornima_5419EE60C2C270C9FED400790122633F/blob/main/scripts

ER-Diagram/
https://github.com/poorni5/Poornima_5419EE60C2C270C9FED400790122633F/blob/main/ERdiagram.png

Query-Results/

https://github.com/poorni5/Poornima_5419EE60C2C270C9FED400790122633F/blob/main/output.png

documentation
https://github.com/3040DB2CBCDDA34BEC04183CB28AD1B4/library_management/blob/main/library_management_report.pdf

https://github.com/3040DB2CBCDDA34BEC04183CB28AD1B4/library_management/blob/main/README.md