SCHOOLOFCOMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENTOFCOMPUTER SCIENCE ENGINEERING	
ProgramName:B. Tech		**AssignmentType: Lab**	**AcademicYear:**2025-2026
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CourseCode	24CS002PC215	**CourseTitle**	AI Assisted Coding
Year/Sem	II/I	**Regulation**	R24
DateandDay of Assignment	Week8 - WednesDay	**Time(s)**	
Duration	2 Hours	**Applicableto Batches**	
AssignmentNumber:16.3(Presentassignmentnumber)/**24**(Totalnumberofassignments)			

Q.No.	Question	*ExpectedTime to complete*
1	**Lab 16 – Database Design and Queries: Schema Design and SQL Generation** **Lab Objectives** • To practice basic SQL query generation with AI assistance. • To analyze AI-suggested queries for correctness and efficiency.	Week5 - Monday

- To understand how AI can help in documenting and improving database logic.

Learning Outcomes

After completing this lab, students will be able to:

1. Use AI tools to design a simple ER diagram / schema for a given scenario.
2. Generate CREATE TABLE statements using AI.
3. Write and refine basic SQL queries (SELECT, INSERT, UPDATE, DELETE).
4. Validate correctness and efficiency of AI-generated SQL.
5. Compare AI-generated vs manually written queries.

Task Description #1 – Schema Generation

Task: Ask AI to design a schema for a Library Management System (Tables: Books, Members, Loans).

SQL Code

```sql
CREATE TABLE Members (
    member_id INT PRIMARY KEY,
    name VARCHAR(100),
    email VARCHAR(100) UNIQUE,
    join_date DATE
);

CREATE TABLE Books (
    book_id INT PRIMARY KEY,
    title VARCHAR(200),
    author VARCHAR(100),
    available BOOLEAN
);

CREATE TABLE Loans (
    loan_id INT PRIMARY KEY,
    member_id INT,
    book_id INT,
    loan_date DATE,
    return_date DATE,
    FOREIGN KEY (member_id) REFERENCES Members(member_id),
    FOREIGN KEY (book_id) REFERENCES Books(book_id)
);
```

PROMPT1: Design a database schema for a Library Management System of Books, Members, and Loans. Include primary and foreign keys.

EXPLANATION:

We need to import sql library and the methods then only it will run properly.import sqlite3: Imports the sqlite3 library, which provides an interface to work with SQLite databases. conn = sqlite3.connect(':memory:'): Establishes a connection to an in-memory SQLite database. This means the database exists only in the computer's RAM and will be lost when the program finishes. Using :memory: is useful for temporary databases or testing.

cursor = conn.cursor(): Creates a cursor object. Cursors are used to execute SQL commands and fetch results from the database.

Task Description #2 – Error Insert Data

Task: Ask AI to generate INSERT INTO queries for the schema above (3 sample records per table).

PROMPT1: Insert atleast 3 records(rows) of each table (members ,books and loan)

CODE:

EXPLANATION:

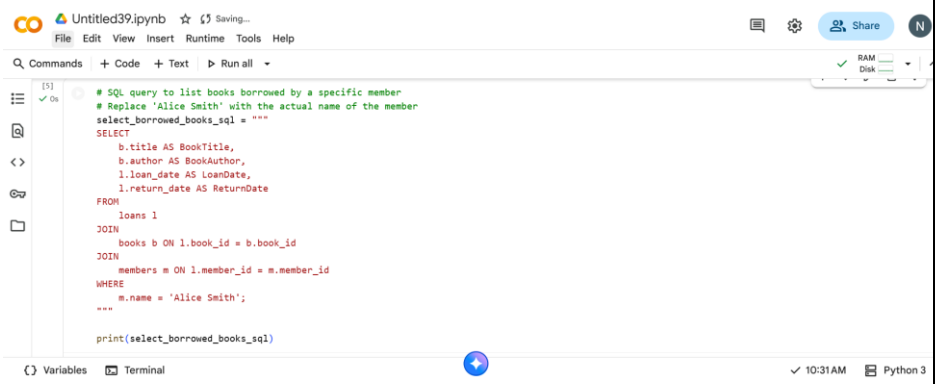
In this Python code defines three multi-line strings, each containing an SQL INSERT INTO query. These queries are designed to insert sample data into the members, books, and loans tables respectively, with three sample records provided for each table. The code concludes by printing a confirmation message indicating that these sample queries have been generated and stored in variables.

Task Description #3 – Basic Queries

Task: Use AI to generate a query to list all books borrowed by a specific member

PROMPT: Write an SQL query to list all books borrowed by a specific member.

CODE:



OUTPUT:

```
SELECT
    b.title AS BookTitle,
    b.author AS BookAuthor,
    l.loan_date AS LoanDate,
    l.return_date AS ReturnDate
FROM
    loans l
JOIN
    books b ON l.book_id = b.book_id
JOIN
    members m ON l.member_id = m.member_id
WHERE
    m.name = 'Alice Smith';
```

EXPLANATION:

This SQL query is designed to retrieve information about books borrowed by a specific member from a library database. It works by joining the loans, books, and members tables together based on their related book_id and member_id columns. The SELECT statement specifies the columns to retrieve: the book's title and author from the books table, and the loan and return dates from the loans table.

Finally, the WHERE clause filters the results to include only the loans associated with the member whose name matches 'Alice Smith' (or the name you specify), effectively listing all books borrowed by that particular member.

Task Description #4 – Update and Delete Queries

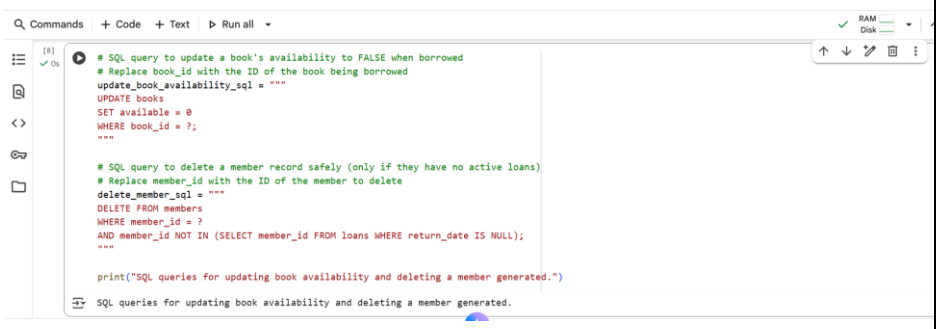
Task: Generate queries with AI for:

- Updating a book's availability to FALSE when borrowed.
- Deleting a member record safely.

PROMPT1:write a query on updating a books availability to false

PROMPT2:delete the member record

CODE:



```
# SQL query to update a book's availability to FALSE when borrowed
# Replace book_id with the ID of the book being borrowed
update_book_availability_sql = """
UPDATE books
SET available = 0
WHERE book_id = ?;
"""

# SQL query to delete a member record safely (only if they have no active loans)
# Replace member_id with the ID of the member to delete
delete_member_sql = """
DELETE FROM members
WHERE member_id = ?
AND member_id NOT IN (SELECT member_id FROM loans WHERE return_date IS NULL);
"""

print("SQL queries for updating book availability and deleting a member generated.")
```

```
SQL queries for updating book availability and deleting a member generated.
```

EXPLANATION:

This code contains two SQL queries designed for managing book availability and member records. The first query, update_book_availability_sql, updates the books table to set the available status to false (represented by 0) for a specific book, identified by its book_id. This is useful when a book is borrowed. The second query, delete_member_sql, safely removes a record from the members table for a specific member_id, but only if that member has no active loans (meaning all their borrowed books have been returned, indicated by a non-null return_date in the loans table).