PG-DAC AUGUST 25
Database Assignment 2

Schema Design & Table Creation (DDL & DML Commands)

1. Define a schema for a Library Management System with the following entities:
   - Books
   - Authors
   - Members
   - Borrow_Records

```
mysql> SHOW TABLES;
+-------------------+
| Tables_in_library |
+-------------------+
| authors           |
| books             |
| borrow            |
| members           |
+-------------------+
4 rows in set (0.03 sec)
```

2. Write the SQL command to create a table Authors with the following fields:
   - author_id (Primary Key, INT)
   - name (VARCHAR(100))
   - country (VARCHAR(50))

```
mysql> create database library
    -> ;
Query OK, 1 row affected (0.03 sec)

mysql> use library
Database changed
mysql> create table Authors(authoeid int PRIMARY KEY,
    -> name varchar(100) NOT NULL,
    -> country varchar(50));
Query OK, 0 rows affected (0.03 sec)
```

3. Write the SQL command to create a table Books with the following fields:
   - book_id (Primary Key, INT)
   - title (VARCHAR(150))
   - author_id (Foreign Key referencing Authors)
   - published_year (YEAR)
   - available_copies (INT)

```
mysql> CREATE TABLE BOOKS(bookid INT PRIMARY KEY,
    -> title VARCHAR(150) NOT NULL,
    -> authoeid INT,
    -> year YEAR,
    -> copies INT DEFAULT 0,
    -> FOREIGN KEY (authoeid) REFERENCES Authors(authoeid)
    -> );
Query OK, 0 rows affected (0.06 sec)
```

4. Write the SQL command to create a table Members with:
   - member_id (Primary Key, INT)
   - name (VARCHAR(100))
   - email (VARCHAR(100), unique)
   - phone (VARCHAR(15))

```
mysql> CREATE TABLE MEMBERS(memid INT PRIMARY KEY,
    -> name VARCHAR(100),
    -> email VARCHAR(100) UNIQUE,
    -> phone VARCHAR(15)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

5. Write the SQL command to create a table Borrow_Records with:
   - record_id (Primary Key, INT)
   - member_id (Foreign Key referencing Members)
   - book_id (Foreign Key referencing Books)
   - borrow_date (DATE)
   - return_date (DATE)

```
mysql> CREATE TABLE Borrow(recordid INT PRIMARY KEY,
    -> memid INT,
    -> bookid INT,
    -> borrowdate DATE,
    -> returndate DATE,
    -> FOREIGN KEY (memid) REFERENCES MEMBERS(memid),
    -> FOREIGN KEY (bookid) REFERENCES BOOKS(bookid)
    -> );
Query OK, 0 rows affected (0.10 sec)
```

6. Modify the Books table to add a column genre of type VARCHAR(50).

```
mysql> ALTER TABLE Books
    -> ADD genre VARCHAR(50);
Query OK, 0 rows affected (0.10 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

7. Write the SQL command to drop the Borrow_Records table.

```
mysql> DROP TABLE Borrow
    -> ;
Query OK, 0 rows affected (0.04 sec)

mysql> SHOW TABLES;
+-------------------+
| Tables_in_library |
+-------------------+
| authors           |
| books             |
| members           |
+-------------------+
3 rows in set (0.00 sec)
```

8. Insert 3 records into the Authors table.

```
mysql> INSERT INTO TABLE Authors VALUES(1,"Yogi","India");
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the rig
ht syntax to use near 'TABLE Authors VALUES(1,"Yogi","India")' at line 1
mysql> INSERT INTO Authors VALUES(1,"Yogi","India");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO Authors VALUES(2,"Death","India");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO Author VALUES(3,"Monk","India");
ERROR 1146 (42S02): Table 'library.author' doesn't exist
mysql> INSERT INTO Authors VALUE(3,"Monk","India");
Query OK, 1 row affected (0.02 sec)

mysql> select * from Authors;
+----------+-------+---------+
| authoeid | name  | country |
+----------+-------+---------+
|        1 | Yogi  | India   |
|        2 | Death | India   |
|        3 | Monk  | India   |
+----------+-------+---------+
3 rows in set (0.00 sec)
```

9. Insert 5 books into the Books table.

```
mysql> INSERT INTO BOOKS VALUE(101,"autobiography of a yogi",1,1946,108);
ERROR 1136 (21S01): Column count doesn't match value count at row 1
mysql> INSERT INTO BOOKS VALUES(
    -> 101,
    -> "autobiography of a yogi",
    -> 1,
    -> 1946,
    -> 108,
    -> "spiritual"
    -> );
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO BOOKS VALUES(102,"death an inside story",2,2020,4,"self realization"),
    -> INSERT INTO BOOKS VALUES(103,"monk who sold his ferrari",3,1996,20,"spiritual");
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for th
e right syntax to use near 'INSERT INTO BOOKS VALUES(103,"monk who sold his ferrari",3,1996,20,"spiritual")' at line 2
mysql> INSERT INTO BOOKS VALUES(102,"death an inside story",2,2020,4,"self realization");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO BOOKS VALUES(103,"monk who sold his ferrari",3,1996,20,"spiritual");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO BOOKS VALUES(104,"Whispers of the Soul",1,2021,90,"Motivation");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO BOOKS VALUES(105,"Shadows of Death",2,2018,100,"triller");
Query OK, 1 row affected (0.03 sec)

mysql> SELECT * FROM BOOKS;
+--------+---------------------------+----------+------+--------+------------------+
| bookid | title                     | authoeid | year | copies | genre            |
+--------+---------------------------+----------+------+--------+------------------+
|    101 | autobiography of a yogi   |        1 | 1946 |    108 | spiritual        |
|    102 | death an inside story     |        2 | 2020 |      4 | self realization |
|    103 | monk who sold his ferrari |        3 | 1996 |     20 | spiritual        |
|    104 | Whispers of the Soul      |        1 | 2021 |     90 | Motivation       |
|    105 | Shadows of Death          |        2 | 2018 |    100 | triller          |
+--------+---------------------------+----------+------+--------+------------------+
5 rows in set (0.00 sec)
```

10. Insert 3 members into the Members table.

```
mysql> INSERT INTO MEMBERS VALUES(2501,"Madhuri","mad@gmail.com",7666010100);
Query OK, 1 row affected (0.03 sec)

mysql> INSERT INTO MEMBERS VALUE(2502,"Rasika","rags@gmail.com",9187034576);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO MEMBERS VALUES(2503,"Sayali","sai@gmail.com",7725091198);
Query OK, 1 row affected (0.02 sec)

mysql> SELECT * FROM MEMBERS
    -> ;
+-------+---------+----------------+------------+
| memid | name    | email          | phone      |
+-------+---------+----------------+------------+
|  2501 | Madhuri | mad@gmail.com  | 7666010100 |
|  2502 | Rasika  | rags@gmail.com | 9187034576 |
|  2503 | Sayali  | sai@gmail.com  | 7725091198 |
+-------+---------+----------------+------------+
3 rows in set (0.00 sec)
```

11.
```
mysql> INSERT INTO borrow VALUES(1001,2501,101,'2025-10-01','2025-10-20'),
    -> (1003,2503,103,'2025-10-01','2025-10-20');
Query OK, 2 rows affected (0.01 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> INSERT INTO borrow VALUES(1003,2503,103,'2025-10-01','2025-10-20');
ERROR 1062 (23000): Duplicate entry '1003' for key 'borrow.PRIMARY'
mysql> INSERT INTO borrow VALUES(1002,2502,102,'2025-10-01','2025-10-20');
Query OK, 1 row affected (0.02 sec)
```

```
mysql> SELECT * FROM borrow;
+----------+--------+--------+------------+------------+
| recordid | memid  | bookid | bdate      | rdate      |
+----------+--------+--------+------------+------------+
|     1001 |   2501 |    101 | 2025-10-01 | 2025-10-20 |
|     1002 |   2502 |    102 | 2025-10-01 | 2025-10-20 |
|     1003 |   2503 |    103 | 2025-10-01 | 2025-10-20 |
+----------+--------+--------+------------+------------+
3 rows in set (0.00 sec)
```

12. Write an SQL query to select all books where published_year is after 2015.
```
mysql> SELECT * FROM BOOKS WHERE year >2015;
+--------+----------------------+----------+------+--------+------------------+
| bookid | title                | authoeid | year | copies | genre            |
+--------+----------------------+----------+------+--------+------------------+
|    102 | death an inside story |       2 | 2020 |      4 | self realization |
|    104 | Whispers of the Soul  |       1 | 2021 |     90 | Motivation       |
|    105 | Shadows of Death      |       2 | 2018 |    100 | triller          |
+--------+----------------------+----------+------+--------+------------------+
3 rows in set (0.01 sec)
```

13.   Write a SQL query to create a foreign key & primary key relationship between two tables.

```
mysql> desc Members;
+--------+--------------+------+-----+---------+-------+
| Field  | Type         | Null | Key | Default | Extra |
+--------+--------------+------+-----+---------+-------+
| id     | int          | NO   | PRI | NULL    |       |
| name   | varchar(100) | YES  |     | NULL    |       |
| email  | varchar(100) | YES  | UNI | NULL    |       |
| phone  | varchar(15)  | YES  |     | NULL    |       |
+--------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> desc records;
+----------+------+------+-----+---------+-------+
| Field    | Type | Null | Key | Default | Extra |
+----------+------+------+-----+---------+-------+
| recordid | int  | NO   | PRI | NULL    |       |
| id       | int  | YES  | MUL | NULL    |       |
| bookid   | int  | YES  |     | NULL    |       |
+----------+------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE records
    -> ADD CONSTRAINT newid
    -> FOREIGN KEY (id) REFERENCES Members(id);
Query OK, 0 rows affected (0.09 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

14.   Write an SQL query to find all members who have borrowed the book with title 'death an inside story'.
```
mysql> SELECT DISTINCT m.memid, m.name, m.email, m.phone
    -> FROM members m
    -> JOIN borrow b ON m.memid = b.memid
    -> JOIN books bk ON b.bookid = bk.bookid
    -> WHERE bk.title = 'death an inside story';
+-------+--------+---------------+------------+
| memid | name   | email         | phone      |
+-------+--------+---------------+------------+
|  2502 | Rasika | rags@gmail.com | 9187034576 |
+-------+--------+---------------+------------+
1 row in set (0.00 sec)
```

15. Update the available_copies column of a specific book (choose any book) by reducing it by 1 after it is borrowed.

```
mysql> SELECT * FROM books;
+--------+-----------------------------+----------+------+--------+------------------+
| bookid | title                       | authoeid | year | copies | genre            |
+--------+-----------------------------+----------+------+--------+------------------+
|    101 | autobiography of a yogi     |        1 | 1946 |    108 | spiritual        |
|    102 | death an inside story       |        2 | 2020 |      4 | self realization |
|    103 | monk who sold his ferrari   |        3 | 1996 |     20 | spiritual        |
|    104 | Whispers of the Soul        |        1 | 2021 |     90 | Motivation       |
|    105 | Shadows of Death            |        2 | 2018 |    100 | triller          |
+--------+-----------------------------+----------+------+--------+------------------+
5 rows in set (0.00 sec)
```

```
mysql> CREATE TRIGGER reduce_copies
    -> AFTER INSERT ON borrow
    -> FOR EACH ROW
    -> UPDATE books
    -> SET copies = copies - 1
    -> WHERE bookid = NEW.bookid AND copies > 0
    -> ;
Query OK, 0 rows affected (0.04 sec)
```

```
mysql> INSERT INTO borrow VALUES(
    -> 1004,
    -> 2503,
    -> 104,
    -> "2025-10-04",
    -> "2025-10-10");
Query OK, 1 row affected (0.03 sec)
```

```
mysql> SELECT * FROM books;
+--------+-----------------------------+----------+------+--------+------------------+
| bookid | title                       | authoeid | year | copies | genre            |
+--------+-----------------------------+----------+------+--------+------------------+
|    101 | autobiography of a yogi     |        1 | 1946 |    108 | spiritual        |
|    102 | death an inside story       |        2 | 2020 |      4 | self realization |
|    103 | monk who sold his ferrari   |        3 | 1996 |     20 | spiritual        |
|    104 | Whispers of the Soul        |        1 | 2021 |     89 | Motivation       |
|    105 | Shadows of Death            |        2 | 2018 |    100 | triller          |
+--------+-----------------------------+----------+------+--------+------------------+
5 rows in set (0.00 sec)
```

16. Delete a record from Members where member_id = 3.

```
mysql> SELECT * FROM Members;
+-------+---------+---------------+------------+
| memid | name    | email         | phone      |
+-------+---------+---------------+------------+
|  2501 | Madhuri | mad@gmail.com | 7666010100 |
|  2502 | Rasika  | rags@gmail.com| 9187034576 |
|  2503 | Sayali  | sai@gmail.com | 7725091198 |
+-------+---------+---------------+------------+
3 rows in set (0.00 sec)

mysql> ALTER TABLE borrow
    -> ADD CONSTRAINT fk_member
    -> FOREIGN KEY (memid) REFERENCES members(memid)
    -> ON DELETE CASCADE;
Query OK, 4 rows affected (0.11 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

```
mysql> UPDATE borrow
    -> SET rdate = CURDATE()    -- sets today's date
    -> WHERE memid = 2503 AND rdate IS NULL;
Query OK, 0 rows affected (0.02 sec)
Rows matched: 0  Changed: 0  Warnings: 0
```

```
mysql> DELETE FROM borrow WHERE memid = 2503;
Query OK, 2 rows affected (0.03 sec)

mysql> DELETE FROM members WHERE memid = 2503;
Query OK, 1 row affected (0.02 sec)

mysql> ^C
mysql> SELECT * FROM Members;
+-------+---------+----------------+------------+
| memid | name    | email          | phone      |
+-------+---------+----------------+------------+
|  2501 | Madhuri | mad@gmail.com  | 7666010100 |
|  2502 | Rasika  | rags@gmail.com | 9187034576 |
+-------+---------+----------------+------------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM borrow;
+----------+-------+--------+------------+------------+
| recordid | memid | bookid | bdate      | rdate      |
+----------+-------+--------+------------+------------+
|     1001 |  2501 |    101 | 2025-10-01 | 2025-10-20 |
|     1002 |  2502 |    102 | 2025-10-01 | 2025-10-20 |
+----------+-------+--------+------------+------------+
2 rows in set (0.00 sec)
```

17. Update a Book name record from Book table with id = 1.

```
mysql> SELECT * FROM books;
+--------+------------------------+----------+------+--------+------------------+
| bookid | title                  | authoeid | year | copies | genre            |
+--------+------------------------+----------+------+--------+------------------+
|    101 | autobiography of a yogi |        1 | 1946 |    108 | spiritual        |
|    102 | death an inside story  |        2 | 2020 |      4 | self realization |
|    103 | monk who sold his ferrari |     3 | 1996 |     20 | spiritual        |
|    104 | Whispers of the Soul   |        1 | 2021 |     89 | Motivation       |
|    105 | Shadows of Death       |        2 | 2018 |    100 | triller          |
+--------+------------------------+----------+------+--------+------------------+
5 rows in set (0.00 sec)

mysql> UPDATE books
    -> SET title = "YOGI the autobiography"
    -> WHERE bookid = 101;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * FROM books;
+--------+------------------------+----------+------+--------+------------------+
| bookid | title                  | authoeid | year | copies | genre            |
+--------+------------------------+----------+------+--------+------------------+
|    101 | YOGI the autobiography |        1 | 1946 |    108 | spiritual        |
|    102 | death an inside story  |        2 | 2020 |      4 | self realization |
|    103 | monk who sold his ferrari |     3 | 1996 |     20 | spiritual        |
|    104 | Whispers of the Soul   |        1 | 2021 |     89 | Motivation       |
|    105 | Shadows of Death       |        2 | 2018 |    100 | triller          |
+--------+------------------------+----------+------+--------+------------------+
5 rows in set (0.00 sec)
```

18. Write an SQL query to list all books along with their authors' names.

```
mysql> SELECT b.bookid, b.title, a.name AS author_name, a.country, b.year, b.genre
    -> FROM books b
    -> JOIN authors a ON b.authoeid = a.authoeid;
+--------+------------------------+-------------+---------+------+------------------+
| bookid | title                  | author_name | country | year | genre            |
+--------+------------------------+-------------+---------+------+------------------+
|    101 | YOGI the autobiography | Yogi        | India   | 1946 | spiritual        |
|    104 | Whispers of the Soul   | Yogi        | India   | 2021 | Motivation       |
|    102 | death an inside story  | Death       | India   | 2020 | self realization |
|    105 | Shadows of Death       | Death       | India   | 2018 | triller          |
|    103 | monk who sold his ferrari | Monk     | India   | 1996 | spiritual        |
+--------+------------------------+-------------+---------+------+------------------+
5 rows in set (0.00 sec)
```

19. Write an SQL query to delete all books from the Books table where the published_year is before 2000.

```
mysql> DELETE FROM borrow WHERE bookid IN (
    ->     SELECT bookid FROM books WHERE year < 2000
    -> );
Query OK, 1 row affected (0.01 sec)

mysql> DELETE FROM books WHERE year < 2000;
Query OK, 2 rows affected (0.03 sec)

mysql> SELECT * FROM books;
+--------+----------------------+----------+------+--------+------------------+
| bookid | title                | authoeid | year | copies | genre            |
+--------+----------------------+----------+------+--------+------------------+
|    102 | death an inside story |        2 | 2020 |      4 | self realization |
|    104 | Whispers of the Soul |        1 | 2021 |     89 | Motivation       |
|    105 | Shadows of Death     |        2 | 2018 |    100 | triller          |
+--------+----------------------+----------+------+--------+------------------+
3 rows in set (0.00 sec)
```

20. Write an SQL query to **find all books that are never borrowed (i.e., no records in Borrow_Records)**.

```
mysql> SELECT b.bookid, b.title, b.year, b.genre
    -> FROM books b
    -> WHERE b.bookid NOT IN (
    ->     SELECT bookid FROM borrow
    -> );
+--------+----------------------+------+------------+
| bookid | title                | year | genre      |
+--------+----------------------+------+------------+
|    104 | Whispers of the Soul | 2021 | Motivation |
|    105 | Shadows of Death     | 2018 | triller    |
+--------+----------------------+------+------------+
2 rows in set (0.00 sec)
```