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Worksheet No. 1

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Branch: MCA (GENERAL) **Section/Group:** MCA- 1-A
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Subject Name: Technical Training **Subject Code:** 25CAP-652

1.Aim/Overview of the practical:

To design and implement a sample database system using DDL, DML, and DCL commands, including database creation, data manipulation, schema modification, and role-based on access control to ensure data integrity and secure, read-only access for authorized users.

2. Objectives:

To gain practical experience in implementing Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language (DCL) operations in a real database environment. This will also include implementing role-based privileges to secure data.

3. Input/Apparatus Used:

- PostgreSQL
- pgAdmin

4.Procedure/Algorithm/Code:

```
CREATE TABLE books (
   book_id INT PRIMARY KEY,
   title VARCHAR(100) NOT NULL,
   author VARCHAR(100) NOT NULL,
   available_copies INT CHECK (available_copies >= 0)
);

CREATE TABLE members (
   member_id INT PRIMARY KEY,
   member_name VARCHAR(100) NOT NULL,
   email VARCHAR(100) UNIQUE
);

CREATE TABLE book_issue (
   issue_id INT PRIMARY KEY,
   book_id INT REFERENCES books(book_id),
   member_id INT REFERENCES members(member_id),
```

```
    issue_date DATE,
    return_date DATE
);

INSERT INTO books VALUES
(1, 'DBMS Concepts', 'Silberschatz', 5),
(2, 'Operating System', 'Galvin', 3);



INSERT INTO members VALUES
(101, 'Amit Kumar', 'amit@gmail.com'),
(102, 'Neha Sharma', 'neha@gmail.com');

-- BOOK ISSUE
INSERT INTO book_issue(issue_id,book_id,member_id,issue_date,
return_date)
VALUES
(1001, 1, 101, '2025-01-10', NULL);



SELECT * FROM books;
SELECT * FROM members;
SELECT * FROM book_issue;

--UPDATE AVAILABLE BOOKS
UPDATE books
SET available_copies = available_copies - 1
WHERE book_id = 1;

--Delete book
DELETE FROM books WHERE book_id = 2

CREATE ROLE LIBRARIAN1
WITH LOGIN PASSWORD 'Anin#1';
GRANT  SELECT ON book_issue TO LIBRARIAN1
```

OUTPUT:

	member_id [PK] integer	member_name character varying (100)	email character varying (100)
1	101	Amit Kumar	amit@gmail.com
2	102	Neha Sharma	neha@gmail.com

	issue_id [PK] integer	book_id integer	member_id integer	issue_date date	return_date date
1	1001	1	101	2025-01-10	[null]

	book_id [PK] integer	title character varying (100)	author character varying (100)	available_copies integer
1	1	DBMS Concepts	Silberschatz	4

4. Learning Outcomes:

1. Creating multiple related tables using primary keys and foreign keys.
2. Constraints like NOT NULL, UNIQUE, CHECK, and PRIMARY KEY.
3. Create a database role and assign permissions, which made me understand the basics of database security and access control.