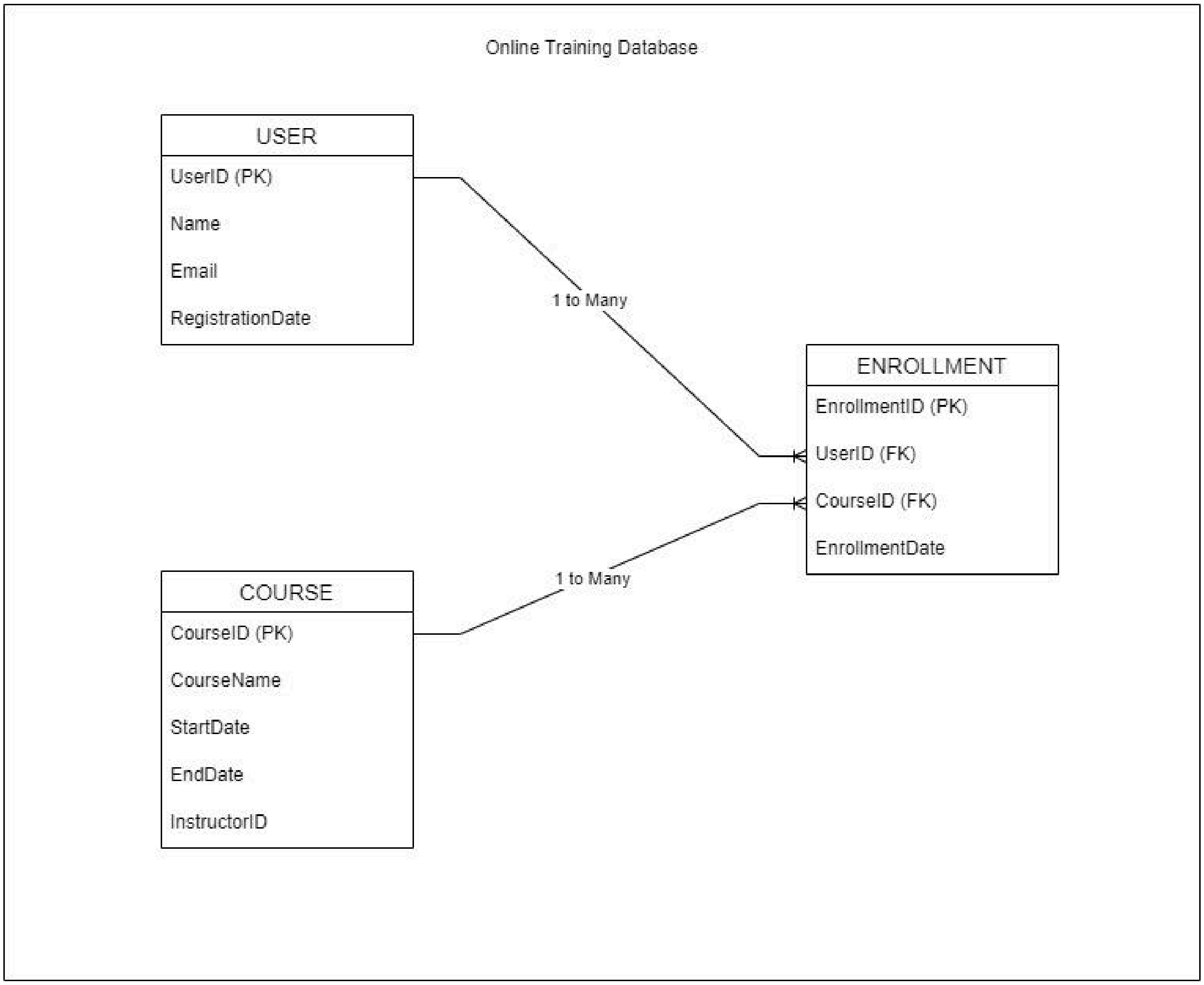
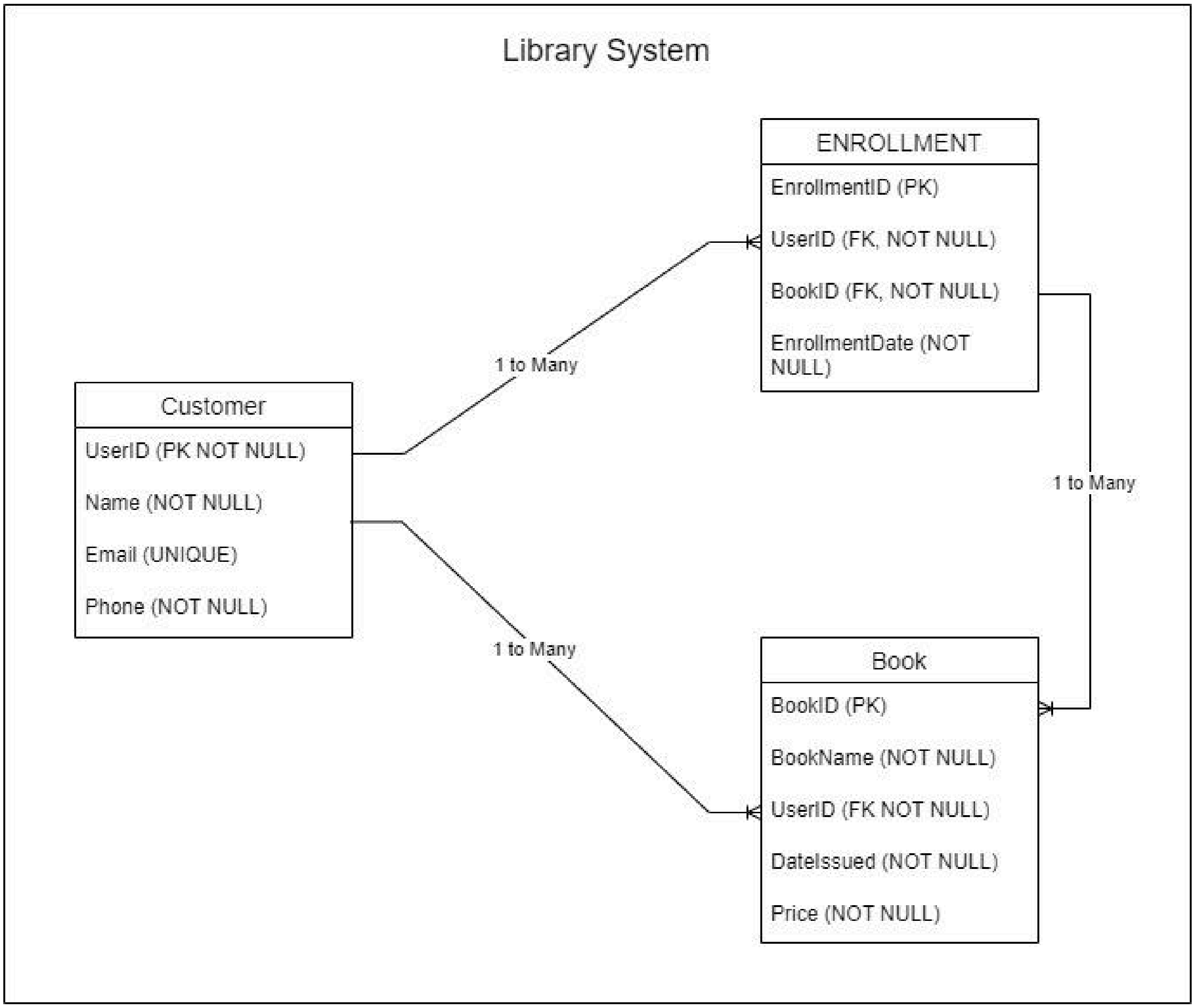
Day 7 Assignment

Assignment 1
Analyze a given business scenario and create an ER diagram that includes entities, relationships, attributes, and cardinality. Ensure that the diagram reflects proper normalization up to the third normal form.



Created on draw.io

Assignment 2
Design a database schema for a library system, including tables, fields, and constraints like NOT NULL, UNIQUE, and CHECK. Include primary and foreign keys to establish relationships between tables.



Assignment 3
Explain the ACID properties of a transaction in your own words. Write SQL statements to simulate a transaction that includes locking and demonstrate different isolation levels to show concurrency control.

use wiprodb;

-- 1. Read Uncommitted Isolation Level

```
SET SESSION TRANSACTION ISOLATION LEVEL READ UNCOMMITTED;

START TRANSACTION;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL < 2460;

COMMIT;

SET SESSION TRANSACTION ISOLATION LEVEL READ UNCOMMITTED;

START TRANSACTION;

UPDATE EMP
SET SAL = 3000
WHERE MGR = 7839 AND SAL < 2460;

COMMIT;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL < 2460;

-- 2. Read Committed Isolation Level

SET SESSION TRANSACTION ISOLATION LEVEL READ COMMITTED;

START TRANSACTION;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL = 3000;

COMMIT;

SET SESSION TRANSACTION ISOLATION LEVEL READ COMMITTED;

START TRANSACTION;

UPDATE EMP
SET SAL = 2460
WHERE MGR = 7839 AND SAL = 3000;
```

```
COMMIT;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL < 2460;

-- 3. Repeatable Read Isolation Level

SET SESSION TRANSACTION ISOLATION LEVEL REPEATABLE READ;

START TRANSACTION;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL = 2460;

COMMIT;

SET SESSION TRANSACTION ISOLATION LEVEL REPEATABLE READ;

START TRANSACTION;

UPDATE EMP
SET SAL = 3000
WHERE MGR = 7839 AND SAL = 2460;

COMMIT;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL = 3000;

-- 4. Serializable Isolation Level

SET SESSION TRANSACTION ISOLATION LEVEL SERIALIZABLE;

START TRANSACTION;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL = 3000;

COMMIT;
```

```
SET SESSION TRANSACTION ISOLATION LEVEL SERIALIZABLE;

START TRANSACTION;

UPDATE EMP
SET SAL = 2460
WHERE MGR = 7839 AND SAL = 3000;

COMMIT;

SELECT ENAME, SAL
FROM emp
WHERE MGR = 7839 AND SAL = 2460;
```

Script link is here : script
Tables link is here : emp table, Uncommitted table, Committed table, Repeatable table and Serializable table.

Assignment 4
Write SQL statements to CREATE a new database and tables that reflect the library schema you designed earlier. Use ALTER statements to modify the table structures and DROP statements to remove a redundant table.

```
CREATE DATABASE LibrarySystem;

CREATE TABLE Customer (
    UserID INT PRIMARY KEY,
    Name VARCHAR(10) NOT NULL,
    Email VARCHAR(25) NOT NULL,
    Phone BIGINT NOT NULL
);


CREATE TABLE ENROLLMENT (
    Enrollment INT PRIMARY KEY,
    UserId INT NOT NULL,
    BookId INT NOT NULL,
    EnrollementDate DATE,
    FOREIGN KEY (UserId)
```

```
        REFERENCES Customer (UserId)
);

CREATE TABLE Book (
    BookId INT PRIMARY KEY,
    BookName VARCHAR(10) NOT NULL,
    UserId INT,
    DateIssued DATE,
    Price INT DEFAULT 0,
    FOREIGN KEY (UserID)
        REFERENCES Customer (UserId)
);


ALTER TABLE ENROLLMENT
ADD CONSTRAINT book_fk
FOREIGN KEY (BookId) REFERENCES Book(BookId);

CREATE TABLE RedudantTable (
    NoPk INT,
    NoName VARCHAR(10),
    UserId INT,
    BookId INT,
    Enrollement INT,
    FOREIGN KEY (UserID)
        REFERENCES Customer (UserId),
    FOREIGN KEY (BookId)
        REFERENCES Book (BookId),
    FOREIGN KEY (Enrollement)
        REFERENCES ENROLLMENT (Enrollment)
);

DROP TABLE RedudantTable;
```

Script has been added to same and link is here : link

Assignment 5

Demonstrate the creation of an index on a table and discuss how it improves query performance. Use a DROP INDEX statement to remove the index and analyze the impact on query execution.

```
CREATE INDEX index_fid ON film_actor(film_id);

SELECT
    *
FROM
    film_actor
WHERE
    film_id = 144;

DROP INDEX index_fid ON film_actor;

SELECT
    *
FROM
    film_actor
WHERE
    film_id = 144;
```

Link to table : table

Link to SQL script : script

Assignment 6

Create a new database user with specific privileges using the CREATE USER and GRANT commands. Then, write a script to REVOKE certain privileges and DROP the user.

```
SELECT
    user
FROM
    mysql.user;


CREATE USER 'sayan'@'localhost' IDENTIFIED BY 'root';

GRANT ALL PRIVILEGES ON wiprodb.* TO 'sayan'@'localhost';

SHOW GRANTS FOR 'sayan'@'localhost';

REVOKE ALL PRIVILEGES ON wiprodb.* FROM 'sayan'@'localhost';
```

```
SHOW GRANTS FOR 'sayan'@'localhost';

DROP USER 'sayan'@'localhost';

SELECT
    user
FROM
    mysql.user;
```

Script is added here : script
Table is added here : User Table, Create User Table, Grant Privileges Table , Revoke Privileges Table, Drop User Table.

Assignment 7
Prepare a series of SQL statements to INSERT new records into the library tables, UPDATE existing records with new information, and DELETE records based on specific criteria. Include BULK INSERT operations to load data from an external source.

```
use librarysystem;

-- Inserting data into Customer table
INSERT INTO Customer (UserID, Name, Email, Phone) VALUES
(1, 'Alice', 'alice@example.com', 1234567890),
(2, 'Bob', 'bob@example.com', 2345678901),
(3, 'Charlie', 'charlie@example.com', 3456789012);

-- Insert sample data into the Book table
INSERT INTO Book (BookId, BookName, UserId, DateIssued, Price) VALUES
(1, 'Book One', 1, '2024-05-01', 100),
(2, 'Book Two', 2, '2024-05-05', 150),
(3, 'Book Three', NULL, NULL, 200),
(4, 'Book Four', NULL, NULL, 250);

-- Insert sample data into the ENROLLMENT table
INSERT INTO ENROLLMENT (Enrollment, UserId, BookId, EnrollementDate) VALUES
(1, 1, 1, '2024-05-01'),
(2, 2, 2, '2024-05-05');

-- Update Data in Customer Table
UPDATE Customer
```

```
SET Name = 'Sayan'
WHERE UserID = 1;
```

Bulk insertion is not possible due to secure_file_priv

Script Added here : script
Table Added here : customer table, book table and enrollment table