EECS 447 Project Part 5

Project Overview:

The overall use of this database is engineered to manage different types of media (books, magazines, digital media), clients, and library locations. This involves documenting transactions such as borrowing and reserving media, maintaining different types of client memberships, keeping track of library staff and locations, and generating reports for given inquiries. The system should efficiently integrate these components so that clients can work with staff members to obtain any desired media.

Scope:

The database will store a collection of books and other media being held at a specified library, along with any relevant information, and allow for the addition and deletion, along with any needed updates for the database. The database will also house information regarding borrowers, members, and library staff, including name, age, membership type, and any other relevant information. The database will keep track of members and their items checked out, as well as any fees they incur or reservations that are placed. It will also keep track of the library inventory, which includes the availability of items stored in the library (some media have multiple copies).

Glossary:

SBN: standard book number

Platform Choice:

We chose to select MariaDB as our platform because of the professor's recommendation, and it seemed like the easiest option for allowing our group to work on the database simultaneously. We were not very experienced with any SQL platforms, so the fact that this one worked best right off the bat helped boost the rate at which we could get the database up and operational.

Physical Schema DDL Statements:

```
CREATE TABLE Client (
        client_id INT PRIMARY_KEY AUTO_INCREMENT,
        first_name VARCHAR(100) NOT NULL,
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    last_name VARCHAR(100) NOT NULL,
    email VARCHAR(100),
    phone_number VARCHAR(20),
    address VARCHAR(100) NOT NULL,
    membership ENUM(‘Standard’, ‘Student’, ‘Senior’) NOT NULL,
    active BOOLEAN NOT NULL,
    max_books TINYINT NOT NULL,
    fines_due DECIMAL(5,2) NOT NULL
);

CREATE TABLE Branch (
    branch_id INT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    address VARCHAR(100) NOT NULL,
    year_established YEAR
);

CREATE TABLE Media (
    media_id INT PRIMARY KEY AUTO_INCREMENT,
    title VARCHAR(100) NOT NULL,
    publication_date DATE NOT NULL,
    media_type ENUM('Book', 'Magazine', 'Digital Media') NOT NULL,
    genre VARCHAR(20) NOT NULL)
    AUTO_INCREMENT=1000;

CREATE TABLE Staff (
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    staff_id INT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    last_name VARCHAR(100) NOT NULL,
    currently_employed BOOLEAN NOT NULL,
    branch_id INT NOT NULL,
    FOREIGN KEY (branch_id) REFERENCES Branch(branch_id)
        ON DELETE CASCADE
        ON UPDATE CASCADE
);

CREATE TABLE Copy (
    copy_id CHAR(7) PRIMARY KEY,
    media_id CHAR(6) NOT NULL,
    branch_id CHAR(3) NOT NULL,
    status ENUM ("Available", "Reserved", "Unavailable"),
    FOREIGN KEY (branch_id) REFERENCES BRANCH(branch_id)
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (media_id) REFERENCES MEDIA(media_id)
        ON DELETE CASCADE
        ON UPDATE CASCADE
);

CREATE TABLE Borrow_Transaction (
    transaction_id INT PRIMARY KEY,
    client_id INT NOT NULL,
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```
        copy_id INT NOT NULL,
        borrow_date DATE NOT NULL,
        due_date DATE NOT NULL,
        return_date DATE NULLABLE,
        overdue_fine SMALLINT NOT NULL,
        FOREIGN KEY (client_id) REFERENCES Client(client_id)
        FOREIGN KEY (copy_id) REFERENCES Copy(copy_id)
);

CREATE TABLE Reservation (
        reservtion_id char(7) PRIMARY KEY,
        client_id CHAR(5) NOT NULL,
        reservation_date DATE NOT NULL,
        FOREIGN KEY (client_id) REFERENCES Client
                ON DELETE CASCADE
                ON UPDATE CASCADE,
        FOREIGN KEY (copy_id) REFERENCES Copy
                ON DELETE CASCADE
                ON UPDATE CASCADE
);

CREATE TABLE Book (
        book_id INT  PRIMARY KEY,
        author VARCHAR(50) NOT NULL,
        ISBN CHAR(13) NOT NULL,
        FOREIGN KEY (book_id) REFERENCES Media(media_id) ON DELETE CASCADE
```

```
);



CREATE TABLE Magazine (
        magazine_id INT  PRIMARY KEY,
        author VARCHAR(50) NOT NULL,
        ISBN CHAR(13) NOT NULL,
        Issue_no CHAR (45) NOT NULL
        FOREIGN KEY (magazine_id) REFERENCES Media(media_id) ON DELETE
        CASCADE
);


CREATE TABLE Digital_media (
        dmedia_id INT  PRIMARY KEY,
        creator VARCHAR(100) NOT NULL,
        FOREIGN KEY (dmedia_id) REFERENCES Media(media_id) ON DELETE CASCADE
);
```

Printed Table Contents:

Located in ‘printed_table_contents.txt’