Library Management System - SQL Project

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Project Overview

This Library Management System project is built using SQL and helps in managing books, student records, and issued book records. It demonstrates concepts of relational databases, foreign key relationships, and practical SQL queries.

ER Diagram (Text Representation)

```
[Books] --------< [Issued_Books] >-------- [Students]
   |                      |                      |
book_id           book_id (FK)           student_id (FK)
title             student_id (FK)        name
author            issue_date             course
quantity          return_date            year
```

Table Creation SQL

```
CREATE TABLE Books (
    book_id INT PRIMARY KEY,
    title VARCHAR(100),
    author VARCHAR(100),
    quantity INT
);

CREATE TABLE Students (
    student_id INT PRIMARY KEY,
    name VARCHAR(100),
    course VARCHAR(50),
    year INT
);

CREATE TABLE Issued_Books (
    issue_id INT PRIMARY KEY,
    book_id INT,
```

```
    student_id INT,
    issue_date DATE,
    return_date DATE,
    FOREIGN KEY (book_id) REFERENCES Books(book_id),
    FOREIGN KEY (student_id) REFERENCES Students(student_id)
);
```

Sample SQL Queries

```
-- Students who have issued books
SELECT s.name, b.title, i.issue_date
FROM Issued_Books i
JOIN Students s ON i.student_id = s.student_id
JOIN Books b ON i.book_id = b.book_id;

-- Books which are currently issued
SELECT b.title
FROM Issued_Books i
JOIN Books b ON i.book_id = b.book_id
WHERE i.return_date IS NULL;

-- Total issued books by each student
SELECT s.name, COUNT(i.issue_id) AS total_issued
FROM Issued_Books i
JOIN Students s ON i.student_id = s.student_id
GROUP BY s.name;
```

Conclusion

This project demonstrates the use of MySQL in building a relational database for a library system. It shows proper use of foreign keys, joins, and aggregate queries in a real-life scenario.