**LIBRARY MANAGEMENT SYSTEM REPORT**

**PROJECT OVERVIEW**

The Library Management System project involves the design and implementation of a relational database to manage a fictional library's books, authors, borrowers, and transactions. The primary goal is to demonstrate proficiency in database design and SQL query writing.

**DATABASE SCHEMA**

**Books Table:**

CREATE TABLE books\_info (

book\_id INT PRIMARY KEY,

title VARCHAR(255),

author\_id INT,

publication\_year INT,

genre VARCHAR(50),

available\_copies INT

);

**Authors Table:**

CREATE TABLE authors\_info (

author\_id INT PRIMARY KEY,

author\_name VARCHAR(100),

birth\_date DATE,

nationality VARCHAR(50)

);

**Borrowers Table:**

CREATE TABLE borrowers (

borrower\_id INT PRIMARY KEY,

name VARCHAR(100),

email VARCHAR(100),

phone\_number VARCHAR(20)

);

**Transactions Table:**

CREATE TABLE transactions (

transaction\_id INT PRIMARY KEY,

book\_id INT,

borrower\_id INT,

borrow\_date DATE,

return\_date DATE

);

**SAMPLE DATA POPULATION**

**Authors Table:**

INSERT INTO authors\_info VALUES

(1, 'Jane Doe', '1970-01-01', 'American'),

(2, 'John Smith', '1985-03-15', 'British'),

(3, 'Emily Johnson', '1990-07-20', 'Canadian');

**Books Table:**

INSERT INTO books\_info VALUES

(1, 'Introduction to SQL', 1, 2010, 'Programming', 5),

(2, 'Data Science Basics', 2, 2018, 'Data Science', 3),

(3, 'Classic Literature Anthology', 1, 2005, 'Literature', 8),

(4, 'Web Development Fundamentals', 2, 2015, 'Programming', 2),

(5, 'Mystery Novels Collection', 3, 2012, 'Mystery', 6);

**Borrowers Table:**

INSERT INTO borrowers VALUES

(1, 'Alice Johnson', 'alice@example.com', '123-456-7890'),

(2, 'Bob Smith', 'bob@example.com', '987-654-3210'),

(3, 'Charlie Brown', 'charlie@example.com', '111-222-3333');

**Transactions Table:**

INSERT INTO transactions VALUES

(1, 1, 1, '2023-01-01', '2023-01-15'),

(2, 2, 2, '2023-02-01', '2023-02-20'),

(3, 3, 3, '2023-03-10', '2023-03-25'),

(4, 4, 1, '2023-04-05', '2023-04-20'),

(5, 5, 2, '2023-05-01', '2023-05-15');

**SQL QUERIES**

**Retrieve all books:**

SELECT \* FROM books\_info;

**Retrieve all authors:**

SELECT \* FROM authors\_info;

**Retrieve all borrowers:**

SELECT \* FROM borrowers;

**Retrieve all transactions:**

SELECT \* FROM transactions;

**Find books available for borrowing:**

SELECT \* FROM books\_info WHERE available\_copies > 0;

**List books borrowed by a specific borrower:**

SELECT books\_info.title, transactions.borrow\_date, transactions.return\_date

FROM transactions

JOIN books\_info ON transactions.book\_id = books\_info.book\_id

WHERE transactions.borrower\_id = [Borrower\_ID];

**Find overdue books:**

SELECT books\_info.title, borrowers.name, transactions.borrow\_date, transactions.return\_date

FROM transactions

JOIN books\_info ON transactions.book\_id = books\_info.book\_id

JOIN borrowers ON transactions.borrower\_id = borrowers.borrower\_id

WHERE transactions.return\_date < SYSDATETIME();

**CONCLUSION**

This project demonstrates the creation of a robust relational database for a library management system, including tables for books, authors, borrowers, and transactions. The SQL scripts provided include table creation, data population, and example queries for data retrieval and analysis.

By showcasing this project, I aim to exhibit my proficiency in database design, SQL query writing, and the ability to implement practical solutions for managing information in a library setting.