

Introduction

Project Overview

This project will implement a library database to manage the borrowing of books and other loanable items, as well as the membership of patrons in the library. This database is built to be easily modified and built upon, with multiple different loanable items being easily able to be added. Additionally, the database will allow for numerous queries to manipulate, visualize, and delete the data.

Scope

The project will consist of relations containing books, with numerous attributes; relations containing library patrons, with books they are renting as well as their individual attributes; other loanable items, like movies or music, and their attributes; and library administrators, and their attributes and privileged functions.

Glossary

Query: A request made to the database to generate, update, or delete data from a given relation.

Administrator: Someone with elevated privileges, and is generally responsible for managing the physical library through the database.

Librarian: Someone who helps members borrow/return books, updates member information, and maintains day-to-day services at the library through the database.

Library Member/Patron: A person who goes to the library with the intention of renting a book or other loanable item, who can loan out certain items, and can return those rented items.

ER Modeling Components

Entities

Book.

- BookID (Primary key, Int)
- Title (String)
- Author (String)
- ISBN (String, Unique)
- Publication Year (Year)
- Genre (String)
- Availability (Boolean, True/False)
- Total Copies (Integer)
- PublisherId (FK from Publisher)

User.

UserID (Primary key, Integer)
First Name (String)
Last Name (String)
Date of Birth (Date)
Email Address (string, unique)
Phone Number (Int)
User Type (string)
Membership Status (string)
Outstanding Fees (int)

Author.

AuthorID (Primary key, Integer)
Name (string)
Date of Birth (Date)

Publisher

PublisherId (Primary key, Integer)
Name (string)
Location (string)

Loan

LoanID
BookID (FK from Book)
UserID (FK from User)
Issued (date)
Due (date)
Returned (date)

Administrator

AdminID
Name (string)
Email Address (string, unique)
Phone Number (Int)

Librarian

LibrarianID
Name (string)
Email Address (string, unique)
Phone Number (int)

Relationships

Author WRITES Book (An author can write 0..n books; A book can have 1..n authors)
Publisher PUBLISHES Book (A publisher can publish 0..n books; A book can have 1 publisher)
Loan CONTAINS Book (A loan can have 1..n books. A book can be loaned 1 time)
User TAKES_OUT a loan (A user can have 0..n loans. A loan can be taken out by 1 user)
User RETURNS loan (A user can return 1..n loans)
Administrator ADDS book (An administrator can add 0..n books)
Administrator DELETES book (An administrator can delete 0..n books)
Administrator ADDS User (An administrator can add 0...n Users)

Administrator DELETES User (An administrator can delete 0...n Users)

Librarian CHECKS IN book (A librarian checks in 0..n books. A book can be checked in 0..n times).

ER Diagram

INSERT PICTURE

