Library Project Design Document

Description

The Library Management System has been designed for Librarians to carry out various services in a library. Each functionality has been explained as follows:

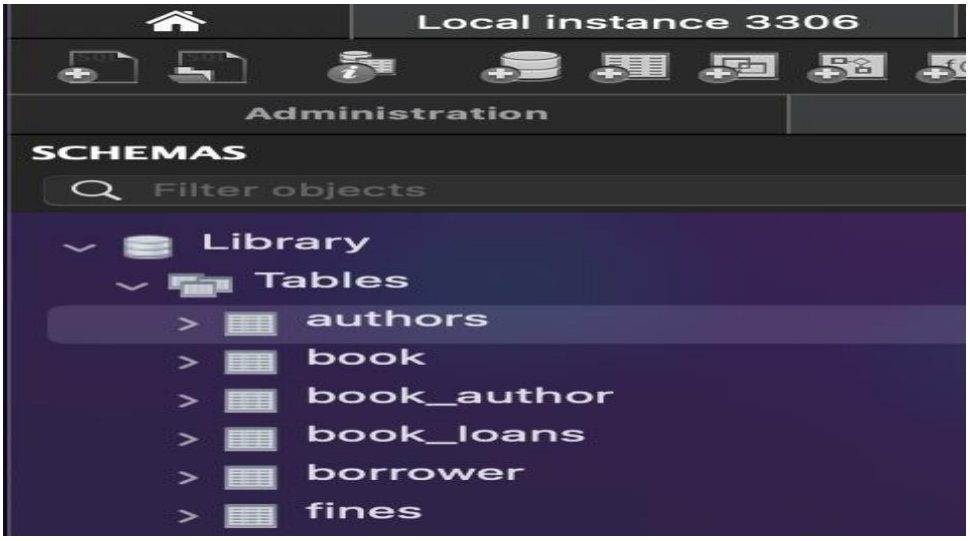
1) Search for a Book
    a. The Librarian can enter either an ISBN, Title Name or Author Name to search for a book.
    b. Substring matching is performed.
    c. Availability of book is also mentioned with the respective book.
2) Check Out Books
    a. The Librarian can check out books for a borrower.
    b. A borrower cannot check out books if the book is unavailable or he/she has already issued 3 books or he/she has a fine pending.
    c. Once checked out, the system automatically sets the due date to be 14 days from the issue date.
    d. Loan id is generated automatically.

3) Check In Books
    a. The Librarian can check in books for a borrower.
    b. To search the book loan entry, the librarian can enter either the ISBN, Card Id or part of the borrower's name.
    c. Once checked in, the system informs if the borrower must pay any fine. If so, the system redirects the librarian to the fines page.

4) Add New Borrowers
    a. The system allows the Librarian to enter new borrowers into the system.
    b. First Name, Last Name, Ssn, Address, City, State, Phone are entered to generate a new Card Id for the borrower.
    c. A person is allowed to have only one Card Id.

5) Fines
    a. Given the Card Id of the borrower, the system helps the librarian retrieve the history of fines for that borrower.
    b. It provides option to display all the fines that are due for each book issued by the borrower, the current total fine the borrower must pay and the fines that have been paid by the borrower in the past.
    c. Every time a fine is paid, the system will update the data base indicating that that fine has been paid.
    d. $0.25 fine is assessed per day.

Schema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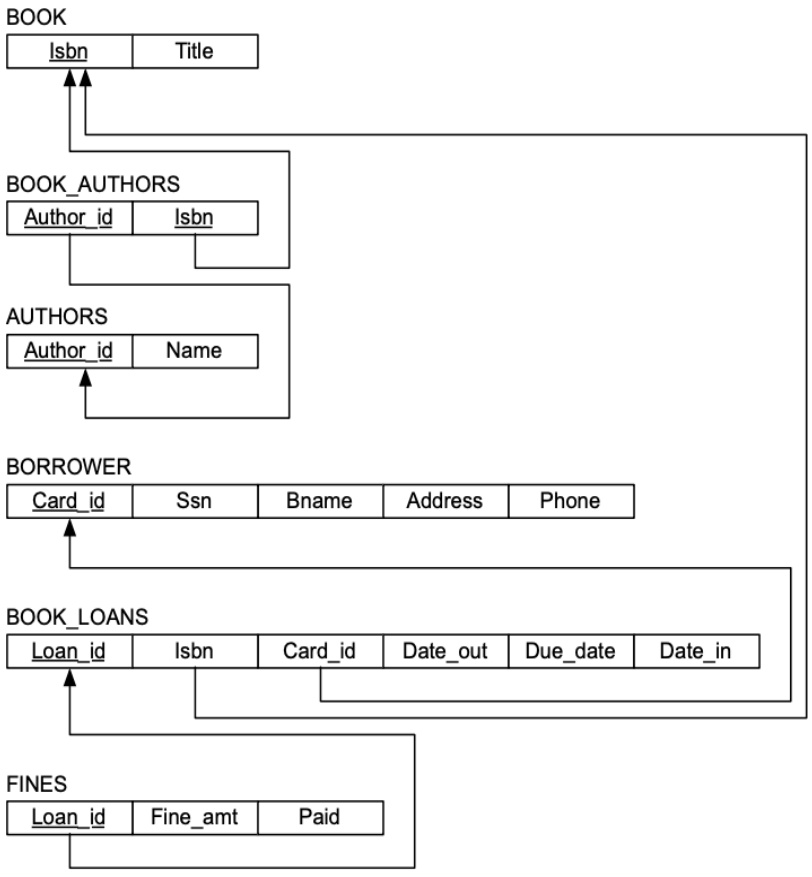
Administration
SCHEMAS
Filter objects
Library
Tables
authors
book
book_author
book_loans
borrower
fines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Isbn
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BOOK_AUTHORS
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Isbn
AUTHORS
Author_id
Name
BORROWER
Card_id
Ssn
Bname
Address
Phone
BOOK_LOANS
Loan_id
Isbn
Card_id
Date_out
Due_date
Date_in
FINES
Loan_id
Fine_amt
Paid

System

- **G**raphical User Interface is implemented using tkinter package which allows implementing Tk widgets as Python classes.
- Data Normalization of books.csv is done using 1NF, 2NF and 3NF. The normalized data is uploaded in the zip file.

The project is basically divided into 5 Files.

· Main.py
· Gui.py
· PayFines.py
· Borrower.py
· CheckIn.py

Main.py

This is entry point to the Library Management System.

Gui.py

It is responsible for running GUI interface where the user can select from options provided like searching for book, adding new borrower, updating fines, paying fines, checking in and out.

PayFines.py

It is responsible for defining the interaction of Fines with rest of the database. When a valid borrower Id is mentioned, it enables the user to display and manipulate the paid value in the Fines table.

Borrower.py

It helps the user in creating a new entry into the borrowers table when the person who tries to check out a book doesn't exist in system.

CheckIn.py

It helps to check in the book borrowed, updates the availability of book and modifies date_in field of borrower table.

Languages/IDE used

1. Python 3.7
2. Sublime Text
3. MySQL Community Server 8.3.01
4. MySQL Workbench Community 8.0.31
5. Mac OS