CS 6360 Database Design
Instructor : Chris Irwin Davis

Individual Project
Milestone 2

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Library Management System

Design Document

Introduction

- **Purpose**
  The Purpose of the document is to describe the implementation of Library Management Application. The Library application is to be designed in order to search a book,author from books and author list , add a new borrower ,pay and show fines
- **Approach**
  The Database design for the application is composed of definitions for database objects derived by mapping entities to tables,attributes to columns, unique identifiers to unique keys and relationship to foreign keys.
- **Overview**
  This document describes the implementation of Overall application for the library management system for librarians.

Milestone 2

Overall Implementation of Library Management System.

Technologies

- DataBase : MySql
- Programming Language : Python 3 with Tkinter enabled

Design Considerations

- **Goals**

  The design goal was to develop a library management system where a librarian can check in and check out a book, add borrower ,and update the fines if the books are returned late.

- **Normalization**

  In order to increase the consistency and avoid the duplicity of data in one place. I have used the 2NF where book and authors are two distinct tables with primary key Isbn for table book and author id for author table.

  In the third table,we have combined the primary keys of both the tables.The primary keys of the Books and Authors are referred to as Foreign keys in this third table.

- **Assumptions**
  - Ssn is a varchar with a length of 9
  - Phone Number with length of 10.

Architecture

- The entire application was developed in python importing the tkinter module.
- Tables are created in the database using MYSQL Workbench.
- Data from the CSV files are imported into the tables created using import wizard and book parser which separates the data as per the table requirements.
- Functions are defined for Search,Add borrower,Pay and show fines,check in and check out of the books and their availability.
- Book availability is defined for the availability of books and check out options for the borrowers.
- Check In is defined for the book to be checked in based on the given borrower Id or name or isbn.
- Add Borrower is defined for an insertion of a new borrower into the borrower table such that all the records must be unique based on the ssn value.
- Update Fines is defined for the updation of fines for all records.
- Show Fines is defined for the display of fines for a particular borrower.
- Pay Fines is defined for the payment of fines for that particular borrower .

User Interface Design

- **Overview of User Interface**
  - ➢ To create a new borrower , it can be done by pressing Add New borrower and entering the borrower details in the add new borrower window.If we are trying to add an existing borrower again it will throw an error and the existing borrower is distinguished by ssn value.
  - ➢ To Search for a particular book, it can be done by clicking on book availability and entering either isbn or book title or author name and will display the existing records based on the entered input. Search format for that is given as isbn,title,author name.
  - ➢ To check out a particular book displayed after searching a particular input in book availability .
  - ➢ To check in a book, you need to provide a particular borrower id or name in order to display those records in the grid and select what book needs to be checked in.
  - ➢ Here Update fines will update the fines for all the borrowers who are yet to return the books.
  - ➢ To display all the fines of a particular borrower, the show fines page will help us to display all the fines.
  - ➢ To pay the fines , it can be done by clicking on pay fines and entering the borrower id in order to display the fine for that borrower and pay fine by clicking on the button payfine.

Conclusion

With this Milestone , I have Successfully implemented the database host application that interfaces with a backend SQL database implementing a Library Management System and users of this system are understood to be librarians.