

Design Document

Library Management System

Database Design CS6360.501

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Arudra Sri Manasa Kosaraju

axk175130@utdallas.edu

Overview of the document:

The library management system is a system that allows library to create and maintain accounts in a library where they can check out, check in books and pay fines for overdue books. This document provides brief overview of the components that have been used along with decisions and assumptions involved to implement the design.

System design:

This is a web application uses HTML, CSS and a bootstrap template for the GUI and the backend is coded using PHP which uses MySQL as the database. The source includes 6 files in total. It contains one HTML file which is for the GUI of the home page. The other PHP files are for the implementation of each of the functionalities of the library management system. It has the GUI and the backend code embedded in the PHP files itself. The options provided are –

1. Book Search and Availability
2. Borrower Management
3. Check- Out books
4. Check-In books
5. View and pay fines.

Database components:

1. Data is imported into MySQL using the import option which is used to import the data that is present in the CSV file.
2. The tables are provided in the tables folder.
3. This contains 6 databases namely authors, book, book_authors, book_loans, borrower, fines.
4. MySQL here uses the port 3307 which is different from the default port 3306.

Display of results:

The results for the book-search and the display of fines are tabulated so that it would be easy for the user to understand the results as the results would be in a more organized way.

Assumptions:

- There is only single copy for each book which is uniquely identified by its ISBN present in the **book** table.

- Check-out and Check-in dates need not be entered manually. The dates are updated in the database automatically depending on the date of issue or date of return.
- Author's information is stored in **authors** table with author's name as fullname, fname and lname.
- The borrower's information is stored in **borrower** table with the borrower's name divided into fname and lname. Borrower's email is also provided in the table. Address is divided into the individual address, city and state and stored independently.
- The **finer** table also includes the Card_id to easily relate Card_id with the Loan_id.
- Previously paid fines for a given card number are filtered by the choice of the user i.e, on the button click.
- The View Fines option , by default, displays the total unpaid sum of fines for each card_id. The search is refined to a particular card by the user input.
- Check-out, check-in and payment is done for one book at a time.
- Pay option in the **View fines by book** option is provided for the unpaid fines with fine amount other than zero.
- A tuple is created in the **finer** table as soon as a person borrows a book with a default fine_amt = 0.
- Fines are updated for the check-in books as soon as they return a book.
- Fine for a book is paid as total fine for that particular book. Splitting of fine for the same book is not allowed.

Third Party Software:

- **MAMP Server:**

1. MAMP is an acronym of macOS, the operating system; Apache, the web server; MySQL, the database management system; and PHP, Perl, or Python, all programming languages used for web development.
2. This is used to run dynamic websites on Windows OS and Mac OS computers.