

# LIBRARY MANAGEMENT SYSTEM

## DESIGN DOCUMENT

### Introduction

The purpose of this Design Document is to present the system design at a level that can be directly traced to the specific system objective along with providing more detailed data, functional, and behavioral requirements. This Design Document contains a high-level description of the system architecture, including design decisions and assumptions. It would be evident that the system is designed as per the requirements stated in the proposal.

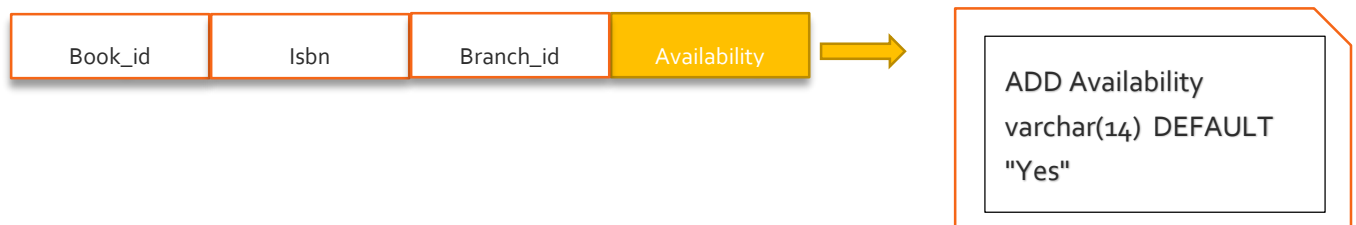
### Database Schema

The database schema conforms to the original database schema provided. Some additional changes were made to the schema to enhance the functionality of the system. Following are the additions to the schema.

#### I. Book\_Copies Table

An additional column was added to the table "Availability"

Purpose: Holds the Availability of a particular book at a particular library branch. It is derived from the "Book\_Loans" table based on the active check-outs for the particular book at the selected branch.



#### II. Book\_Loans Table

The book\_loads table has the primary key "loan\_id", to make real time check outs possible, an auto-increment constraint was added to the system.

```
ALTER TABLE book_loans MODIFY COLUMN loan_id INT NOT  
NULL AUTO_INCREMENT;
```

### III. Selecting Library Branch

Using the GUI the librarian should be able to check out a book at the current location. In the system design, I have implemented this requirement using the a “Combo--box”, called “Library Branch”. It allows the user to select the current library branch & make book transactions at that branch. As shown in figure below, the “Search” functionality as well as the “Check-Out” functionality would work based on the branch selected.

Welcome To Awesome Library Management System

Account Holder: Jack | What Would you like to do today ! [Log Out](#)

**Book Search & Check Out** | Check In & Fine Management | Borrower's History

Search Field:

Note: Enter ISBN, Book Title OR Author Names Separated by Comma(,)

Library Branch: Oak Lawn ▼

[Search Library](#)

ISBN	Book Title	Author(S)	Branch Name	Availability
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Note: Please Select the Book to Check Out from the Search Results

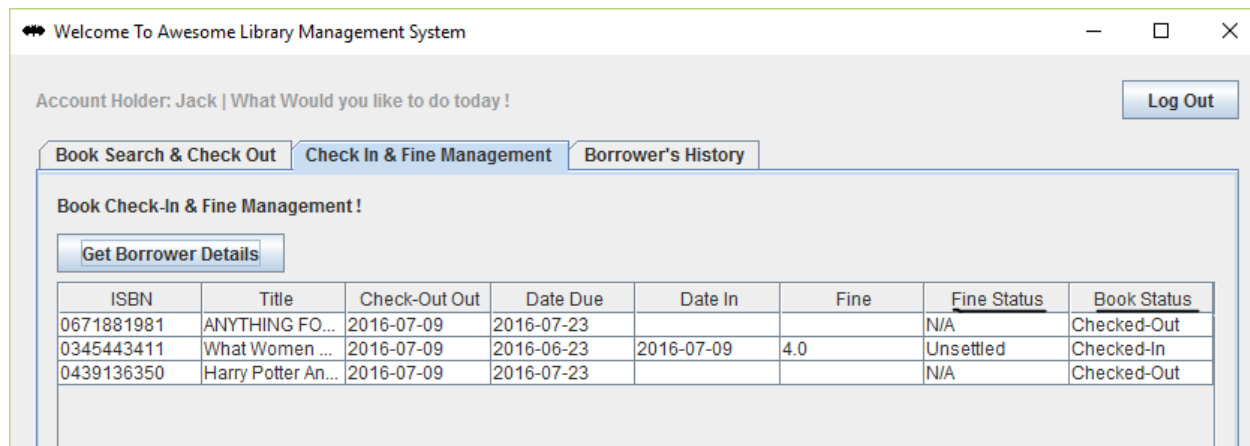
[Check Out Book](#)

### IV. Fine Status & Book Status

In the Check-In & Fine Management section of the application, the two columns “Fine Status” & “Book Status” are derived columns. They derive their values from the “Book\_Loans” and “fines” tables. They read the active book loans due date & the fine incurred till date & reflect the status accordingly.

Fine Status: It can take the following values: N/A, Settled, Unsettled

Book Status: It can take the following values: Checked-Out, Checked-In, Overdue



## V. Borrower's History Tab

On the application, I have added a "Borrower's History" tab, it allows the user to check the lending history of the user & this allows the librarian to have the information about all the books borrowed by the cardholder till date.

## External Libraries Used for Project Design:

- ➔ Java Swing framework for UI design
- ➔ Java AWT library for UI design
- ➔ Java SQL library for enabling SQL commands in Java
- ➔ External JDBC connectors enabling connection to SQL server