

# LIBRARY MANAGEMENT SYSTEM

## DESIGN DOCUMENT

Net ID : adp170630

### ABSTRACT :

The library management system is designed to digitize the day-to-day activities of a librarian. All records of the books, borrowers, loans and fines are maintained in the database. The librarian uses the GUI to interact with the database and perform operations like searching a book, checking in and out a book, adding a new borrower and managing fines.

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Database schema :

Database name : library

Table **Books** : Contains ISBN & title of every book.

Table **Authors**: Contains Name of Authors and their individual unique Author ID.

Table **Book\_Authors** : Contains ISBN of every book and their corresponding Author's ID.

The ISBN in this table must be present in table Books and Author ID must be present in table Authors as they both have foreign key constraints.

Table **Borrower** : Contains unique card ID, unique SSN, first name, last name, email address, postal address & phone number of the borrowers in the system. The Card ID is autogenerated for borrowers. No two borrowers can have same SSN or card ID.

Table **Book\_Loans** : Contains Loan ID, ISBN, Card ID, Check out date, Due date & Check in date of a book loan. The loan id is autogenerated for every transaction, isbn has foreign key on Table Books' isbn, card id must be present in the Borrower table. Default check in date is null.

Table **Fines** : Contains Loan ID , Fine amount & Payment status of fine. Loan ID has foreign key on table Book\_Loan' s loan id. 'Paid' is a Boolean field - If the fine is paid it is True or 1 or else if the fine is not yet paid, it is False or 0.

Classes in Java :

Class Book maps the table Books in database. It has a Boolean field 'availability' which is computed from the book\_loans table – if the book is currently checked out i.e. date\_in =null, availability is False and the book cannot be checked out again.

Class Book loans maps the table Book\_loans from database.

Class Borrower maps the table borrower from the database and deals with managing their details.

Class Fine deals with calculating and updating the fines in the database and displaying the same to the user.

The starting page of GUI is index.html