**SYSTEM DESIGN AND ARCHITECTURE**

This project demonstrates the use of data science for the purpose of creating a simple library management system. In this system we maintain and perform operations on a database that contains information about the books in the library and keeps track of the borrowers of the books. Using this application, we can check out and check in books, we can also add new borrowers and calculate fines on books.

The system consists of frontend view which displays the information. The we have the controllers which fetch information from the mysql database and send the information to the views. Then we have the mysql database where we store all the tables which we query in order to fetch relevant information.

The Assumptions made in this system design are many.

1. We assume that there is no preexistent irrelevant data.
2. The database is assumed to be small.
3. The application is currently only tested to work on a local machine and not tested on servers.
4. Validations are left to the minimum.
5. Books addition and removal from inventory is not handled.
6. Many other features like elibrary, etc. that could be included are not taken into consideration.
7. The system is only made to be manages by a library employee.
8. No security system is integrated into the project.

**DATABASE DESIGN**

The Database Consists of eight tables which can be described as follows –

AUTHORS – This table consists of all the authors details who’s books are there in the library.

BOOK – This Table contains the book title and the ISBN for the book.

BOOK\_AUTHORS – This Table contains the Author ids corresponding to the different Book ISBNs.

BOOK\_COPIES – This table tells about the number of copies existent in a branch.

BOOK LOANS – This table consists of details about each book loan, including details of the book and dates when the books was issued and when the book is due return and when the book is actually returned.

BORROWER – This table stores the details including card no and contact details of the borrower.

FINES – This Table stores the fines calculated from the Book Loans Table. Also stores information about whether the fine was paid or not.

LIBRARY BRANCH – This table contains information about the carious library branches.

**VIEW DESIGN**

The Views consist of the following –

THE BOOK SEARCH VIEW – From this view you can search books by entering ISBN, Title and Authors.

CHECKOUT VIEW – From this view you can check out a book given ISBN, Branch and Card Number.

THE BOOK CHECK IN VIEW – From this view you can search Book Loans and check in any book there.

THE BORROWER MANAGEMENT VIEW – You can add borrower from this view.

THE FINE MANAGEMENT VIEW – You can update fines from this view, also you can pay fines from here.