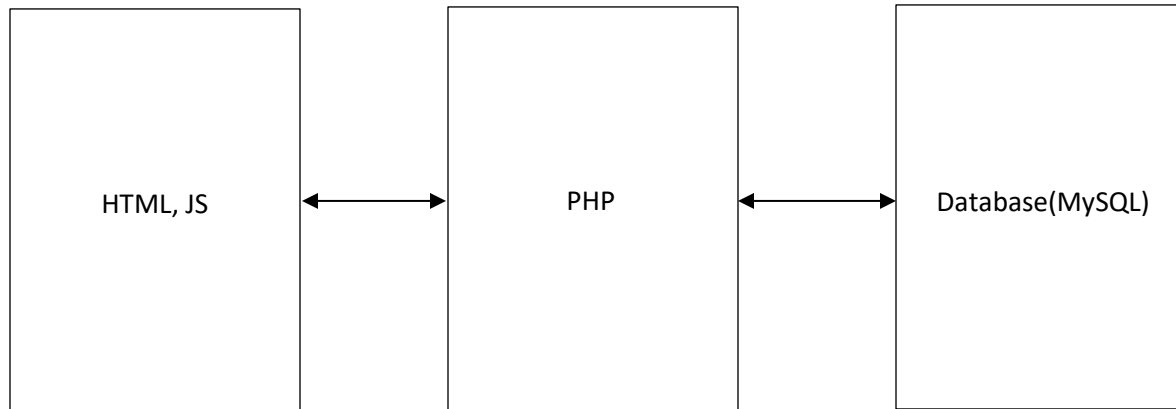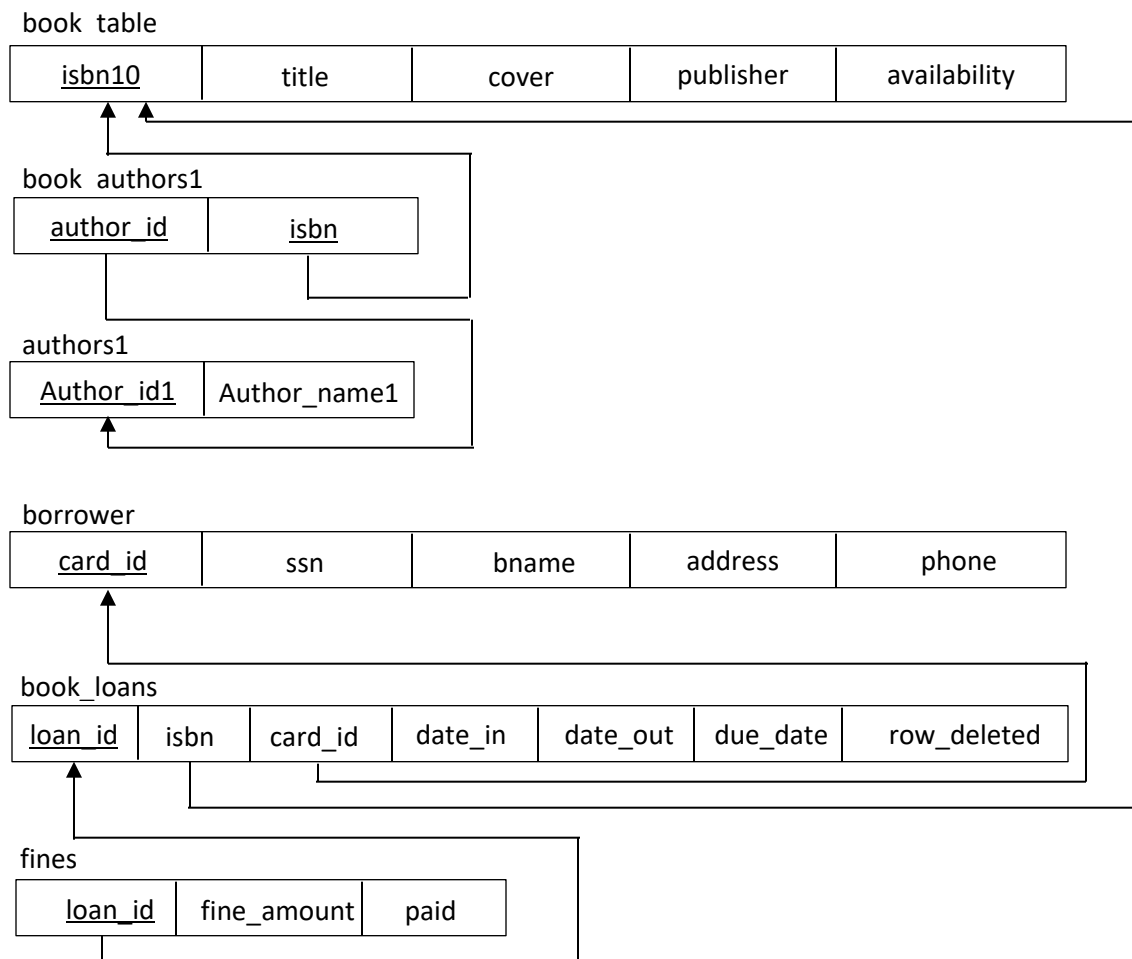# Design Document

Architecture

A three tier architecture is used where HTML, jQuery is the client(Graphical user interface), PHP is used as web server and MySQL is used as database. The above figure describes the same.

Schema

book table

isbn10	title	cover	publisher	availability

book authors1

author_id	isbn

authors1

Author_id1	Author_name1

borrower

card_id	ssn	bname	address	phone

book_loans

loan_id	isbn	card_id	date_in	date_out	due_date	row_deleted

fines

loan_id	fine_amount	paid

The schema diagram is as shown above. Apart from the given schema, the following <u>assumptions</u> have been made,

1. Column availability has been added to book_table table to indicate if the book is available to borrow or not i.e 0 and 1 respectively.
2. Column row_deleted has been added to book_loans table to indicate if the book has been returned or not i.e 1 and 0 respectively.
3. Single book can be checked in or out at a time.
4. From the given data, isbn10 has been used.
5. Card_id is necessary to pay the fine.
6. Payment of fine is done one book at a time.
7. There might be more than one entry for the title but the ISBN values will be different.
8. The librarian should refresh the fines table every day before any check out operations are performed.

<u>Design decisions:</u>

The data was normalized using excel ie the authors column in the given data had multiple values. This was resolved by creating new tables.

The address was split into address, city and state in the given data. This was merged to one column named address using excel.

<u>Description:</u>

The graphical user interface is implemented using HTML and CSS. The information from HTML is sent to PHP through JS file. The PHP file uses this data obtained to query the database and retrieve the relevant information. The retrieved information is sent back to HTML through JS and displayed on the page.

<u>Softwares used:</u>

1. Eclipse IDE
2. MAMP
3. MySQL workbench

<u>Database:</u>

SQL is used to implement the data. Excel is used to modify the data so that it can be used to populate the table without violations.