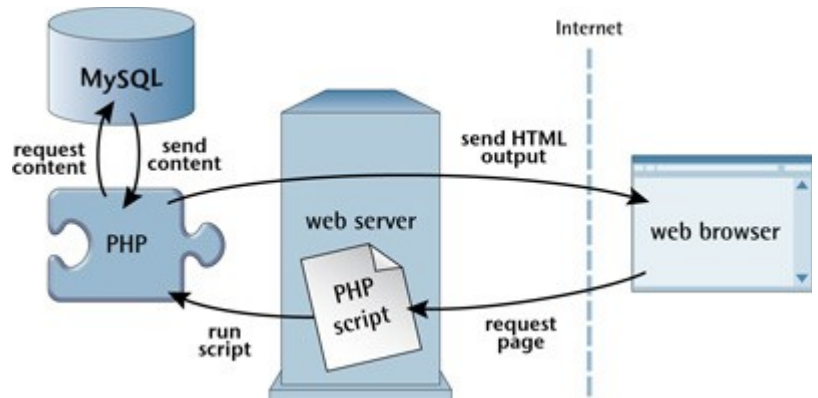Design Document

kac160230
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Language : Mysql, PHP and HTML

Objective :- To build a system that allows librarians to look up books, Enter New Borrowers into the system, Loan out books and manage their return and fines.

The Architecture consists of three main Blocks:

1) The Database
2) Data Retrievel
3) Views and GUI

The Figure summarizes the mechanism that is being used for the project. The database is constructed using mysql and scripts which read in data from csv files.
An example of a script to load the data from a text file is:-

LOAD DATA LOCAL INFILE '/home/kashif/Desktop/java/files/Borrower.txt' INTO TABLE Borrower;

1) The Database
The database Schema is exactly like below
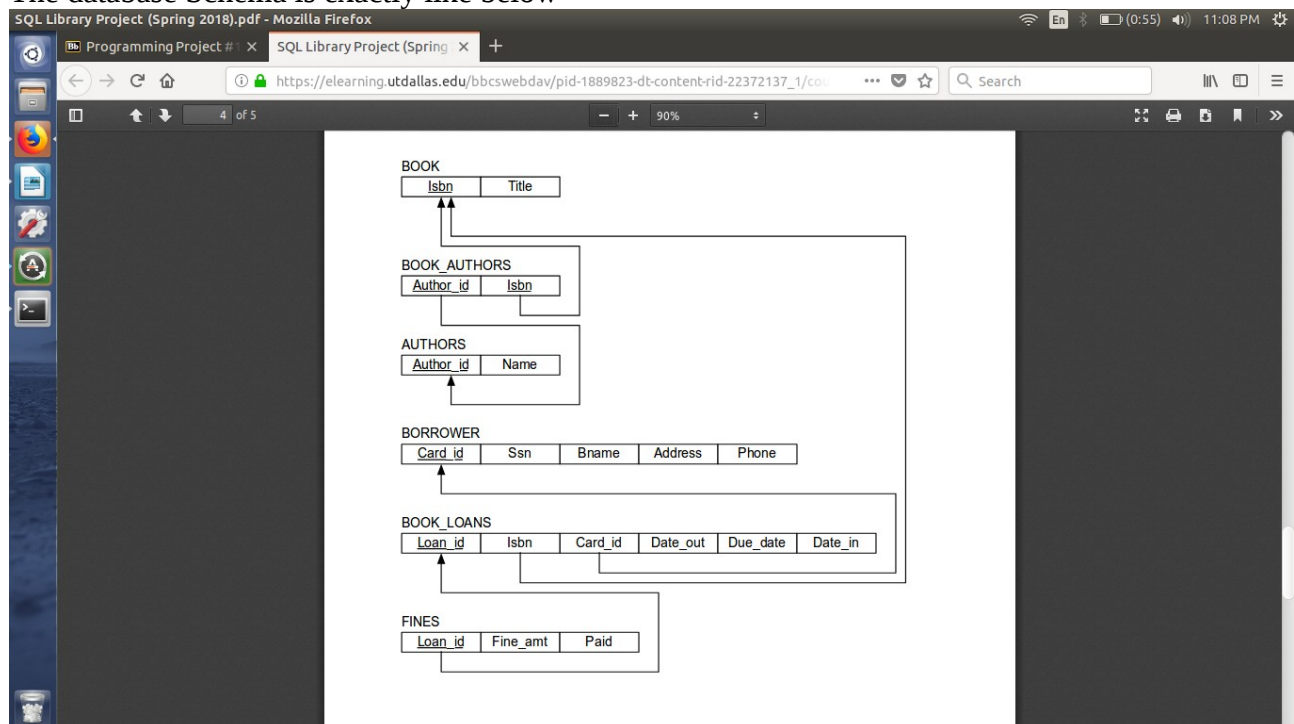
It consists of the following tables :-
1) Books
2) Book_Authors
3) Book_Loans
4) Fines
5) Authors
6) Borrowers

The Primary and the foreign keys are shown above in the schema. The Values that are writted into the DB are mostly hard coded so the datatypes are taken care of at the FE in the HTML forms, Hence some datatypes were not defined to be a certain type, for example in loans the Paid field wasnt set to Boolean and was used as char only. However fields like SSN and the primary keys were well taken care of and checks were placed onto them like length and the datatypes being enetered.(Mostly using the Sql CHECK command).

2) Data Retrieval
The data retrieval is done using PHP. The SQLI methods and commands for php 5 were employed and used. First a connection is opened to the database first and a set of queries are passed in the form of a string to the BE. The User can control only certain attributes of the string, eg the ISBN's and search strings for Authors name.
Since PHP needs a web server, A localhost server needs to be set up for the php files. Apache was used in this context since it works best with PHP.
The following are the different php files which are used to implement the documented functionality
1) logindb.php (The file that contains the functionality to search for a book)
2) CreateNewBorrower.php (File that creates a new borrower in the system)
3) Fines.php (Calculates and updates fines)
4) BookBack.php and CheckBack.php (Files to return the book in the system)
5) Loanbook.php (To loan out a book and updating the database)
6) login.html (The main Page which will be detailed out later).

There are some assumptions that are notable :-
1) SQL injection isnt taken care of
2) The queries arent optimized in any way
3) The GUIwas formed keeping in mind simplicity and complex design patterns are not employed in interest of time

3) GUI or login.html
The login.html page provides the UI for the library management to interact with the database. Appropriate checks have been placed on the page so as to cater to the documentation and the requirement. The error messages are meant to be as indicative as possible of the errors and the successes. The language used for the FE is HTML and forms are used to take in data from the USER and POST it to the Database.
HTML was used since it works very well with PHP and because of its simplistic nature.
The GUI may not necessarily work well with Firefox or with IE, but it works well with Google Chrome

4) Other Relevant information
Apache works best with PHP, other servers like TOMCAT Glowfish. The php uses MySQLi extension to interact with the database