Design Document of Library Management System

System Architecture:

The System Architecture has four modules:

1) Book Search and Availability
Using the GUI, the librarian is able to search for a book, given any combination of ISBN, title, and/or Author(s). The search interface has a single text search field (like Google) and is case insensitive.
The following are displayed in the search results:
• ISBN
• Book title
• Book author(s) (displayed as a comma separated list)
• Book availability (is the book currently checked out?)
2) Book Loans
Checking Out Books
• Once found in a search, the librarian is able to check out a book after being prompted for a BORROWER(Card_no
The date_out is default to be today's date.
The due_date is 14 days after the date_out.
• Each BORROWER is permitted a maximum of 3 BOOK_LOANS. If a BORROWER already has 3 BOOK_LOANS, then the checkout (i.e. create new BOOK_LOANS tuple) will fail and returns a useful error message.
• If a book is already checked out, then the checkout will fail and returns an useful error message.

Checking In Books
• The librarian is able to check in a book.
3) Borrower Management
• The librarian is able to create new borrowers in the system.
• All name, SSN, and address attributes are required to create a new account (i.e. value must be not null).
• A new card_no primary key is generated for each new tuple that uses a compatible format with the existing borrower IDs.
• Borrowers are allowed to possess exactly one library card. If a new borrower is attempted with the same SSN, then a useful error message is returned.
4) Fines
• fine_amt attribute is a dollar amount that should have two decimal places.
• paid attribute is a boolean value that indicates whether a fine has been paid.
• Fines are assessed at a rate of $0.25/day (twenty-five cents per day).
A student can pay fine after checking in or can pay fine later with the loan id.

Design Decisions and Assumptions:

Design Decisions:

author_id, isbn, loan_id, card_id have been selected as Primary Keys.

There are 7 tables in the library database.

Assumptions:

1)The librarian will be provided with an id and password by the university to access the application.

2)Receipts are generated when a student checks out and checks in a book.

3)If a student pays fine later he has to bring the check in receipt.

4)Only librarian has access to the application.

5) When a new student is registered, the Librarian has to check university id of the student which proves that he is a student of that university.

6) SSNs have been considered unique.

7) Only authorized faculty have access to the database because it stores SSN of students and passwords of Librarians.