

## Design document for Library Management Application (ssb180002)

### Database schema design:

The library database consists of six tables

#### 1. Authors table

- 1) the author\_id is a unique identifier for all authors of type unsigned integer of size 10.
- 2) The author name is of varchar type with a maximum size of 70 characters. The author name is a single string that may contain authors' first names, last names, middle names or prefixes, The entire name is not divided into components.

#### 2. Book Table

- 1) The ISBN is a field of character type of size 10. Though ISBN 13 is provided in the input data, since it is not required in the system, the size of ISBN is kept constant to 10. This acts as primary key for all entries in the book table.

- 2) The title of the book is a single string that can accommodate 256 characters.

- 3) The available field is an integer that is set to either 0 or 1 in the system which determine if the book is available to check out or is already borrowed by some other user.

- 4) Authors stores the authors of the corresponding book row. It is a character string of size 200.

Other fields that are provided in the input file are not required by the system and hence are not considered.

#### 3. Book\_authors table

- 1) The author\_id is a unique identifier for all authors of type unsigned integer of size 10.
- 2) The ISBN is a field of character type of size 10. Though ISBN 13 is provided in the input data, since it is not required in the system, the size of ISBN is kept constant to 10. This acts as primary key for all entries in the book table.

#### 4. Book\_loans table

- 1) Loan\_id is an unsigned integer of size 10 that acts as a unique identifier for all loans in the book\_loans table. This value is calculated by the database automatically when every new entry is made into the table.

2)ISBN is a 10 character string that is determined from the book table for referencing individual books.

3)'Name' refers too the book title which is obtained from the book table and is a string of 256 characters. It is used to keep track of the name of the book that is currently borrowed.

4)Card\_no is the unique identifier of every user of the system assigned by the system every time a new borrower profile is created.It is an integer of size 4.

5)'Date\_out' is used to stored the date when a particular book was checked out.

6)'Due\_date' is the last date the book can be returned without having to pay a fine. It is calculated as the system as 15 days after the check out date.

6)'Date\_in' is the date when a borrowed book was returned (or checked in).

Date\_out,Date\_in,Due\_date have their datatype as date.

## **5. Borrower Table**

1)Card\_no is the unique identifier of every user of the system assigned by the system every time a new borrower profile is created.It is an integer of size 4.

2) 'Ssn' is the unique identifier for every user. It is a character string of type 11 and needs to be entered by the user during borrower registration. Every borrower must have a corresponding ssn associated with him/her.

3)'Fname' stores the first name of borrower. It is a character string of size 16.

4)'Lname' stores the last name of borrower. It is a character string of size 16.

5)'Address' stores the street and apartment name of borrower's address. It is a character string of size 50.

6)'City' stores the name of the city the borrower resides it.This will be considered as a part of the address. It is a character string of size 16.

7)'State' stores stores the name of the state the borrower resides it.This, too , will be considered as a part of the address. It is a character string of size 16.

8)'Phone' stores the borrower's phone number. It is a character string of size 16.

## 6. Fines Table

1)The 'loan\_id' uniquely determined every book loan . It is taken from the book\_loans table.It is an unsigned integer of size 10.

2)'Fine\_amt' is the amount due to be paid for every book loan. This is calculated based on the number of days then book has not been checked in for, after the due date at a rate of \$0.25 per day. This is stored as a decimal value with two digits after the decimal point.

3) Card\_no is the unique identifier of every user of the system assigned by the system every time a new borrower profile is created. It is an integer of size 4.

4)The 'paid' field is an integer field that is used to denote whether the fine has been paid for the corresponding book loan. The fines table stores the current pending values for book\_loans as well as those which were pending before and have been paid off. The paid off book\_loans in the table are only for a record and do not have any changes made to them.