LIBRARY MANAGEMENT
DATABASE DESIGN

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ABSTRACT

A. Application:
'Library Management' applies a windows desktop application named Comet Library. The major functionality set/modules of comet library are,

1. Book Search
2. Check Out
3. Check In
4. Borrower Management – a. add new borrower , b. view existing borrower details.
5. Fine Management – a. View current fine status/per loan. b. View total fine of a card holder.

B. Database:
The Database Schema is designed with book, book_authors, book_copies, book_loans, borrower, fines, library_branch. Book ID represents a unique book entity. Loan ID represents a unique loan issued from the library. One item is checked out and checked in per each loan. Borrower ID represents an individual borrower or library member who can check out and check in library items. Branch ID represents one particular branch of the library.

General Business Constraints: A borrower can only check out three items at a time. A borrower is required to return an item before he pays any fine for the particular item. A fine of 0.25 is assessed/per day of over due. A book is due after 14 days of check out. Number of copies available and out are maintained for each branch.

C. Other Design Decisions/Justifications:

Author name and the First name, Middle name, Last names of an author are stored separately. This is to adhere to the specifications identified from the initial requirements.

When a search results in null result, a message box appears. However, the previous search results, if any, remains in the list. This is to facilitate restoring previous search, on occurrence of the librarian trying to enhance the search results by providing additional parameters and which in turn does not produce any result.

All manipulations, insertions and modifications are executed as queries in coded within the program, considering to be minimal and optimal to do so.

All changes seen by the librarian are immediately updated with the back end database. Only recent valid data is displayed in the GUI.

No sub string matching for card holder number is provided either during check in /check out or during

finding a borrower.

D. User Specifications:

a. **Search for an item:** In order to search for an item, run the application and Enter the search details in the search panel.
If the librarian needs to search with the entire author name she has to check in the corresponding text box and provide the author name *in right order* split between the three text boxes.
When no search criteria is provided or there is null result for a particular criteria, the librarian will be notified accordingly
The search results are displayed in a table for the librarian to view.

b. **Checking out an item:** In order to check out an item the librarian has to first search and retrieve an item by using module a).
Once an item has been listed in the search results table, the librarian can then select the item and click on issue item button.
If no item is selected or multiple items are chosen appropriate error message is displayed accordingly.
Once an item is chosen and the button is clicked, the librarian will be prompted to provide a valid card number. If the card number is not valid, the librarian will be notified and no check out takes place.
Otherwise, a check out happens, and the search item is clicked by pre programming for the second time after the check out.
If a librarian attempts to check out an item from a particular branch where no copy of the corresponding item is available, again a prompt is displayed and the check out does not happen.

c. Checking in an item: Similar to check out, Return Item button will lead the librarian to a search page.
Here item to be checked is searched based on either the entire card number of a borrower or sub string matching on book id and card holder's name.
Only the unchecked items are returned in the search result and displayed in a similar table format as in the check out module.
The chosen item, once checked out will be dynamically removed from the list.

d. Borrower Management: When a librarian needs to add a new borrower, add borrower button should lead to a add page where the details are received, validated and stored according to the specifications.
The auto generated card number is printed along the success message.
When a librarian needs to retrieve the details of a particular card number, this can be achieved by clicking on the find borrower button and providing a valid card number in the next window.
The retrieved details also include paid and unpaid fine amount of the card holder/borrower.

e. Fines: Comet Library provides the librarian with options to view existing fines, their paid status.
The librarian can update the paid status through Pay button, once the borrower pays the corresponding fine in the real world. This change is then immediately reflected in both the GUI and in the back end.
Each card holder's total fine (paid and unpaid separately) is printed.

E. Technical Dependencies:

MySql Version 6.1.7601 is used.
NetBeans 7.4 is used & java platform jdk 7u45 is used.