

LIBRARY MANAGEMENT SYSTEM

DESIGN AND IMPLEMENTATION

The Library Management System simplifies the day to day work of a librarian as it has several tables to perform various operations like searching a book based on keywords, checking in and the book as required, adding a new borrower and updating of fine. The database for the library management system consists of below tables:

AUTHOR:

1. This table comprises of the Author_id which is the primary key for the table.
2. Other attribute is Author_name. It is a single string to store the complete name of the author.

BOOK:

1. The Primary key of BOOK table is the ISBN.
2. No_of_copies is of type INT. It stores the total number of copies of the book owned by the library.

BOOK_AUTHORS:

1. This table maps the books to their authors.
2. It contains Author ID which references the key from Author table and ISBN which references the key from Book Table.

BORROWER:

1. This table stores the data from all borrowers.
2. Card_No is the primary key which is automatically generated for each new borrower.

3. SSN is of type character with a length limit of 11.
4. Fname and Lname respectively stores the First Name and Last Name of the borrower. The have a size limit of 16.
5. Address stores the borrower's address. It is of type VARCHAR with a size limit of 64.
6. Address stores the borrower's address. It is of type VARCHAR with a size limit of 64.
7. City stores the borrower's city. It is of type VARCHAR with a size limit of 16.
8. State stores the borrower's state. It is of type VARCHAR with a size limit of 16.
9. Phone stores the borrower's phone number. It is of type Char with a size limit of 14.

BOOK_LOANS:

1. This table stores the data for all the books that are borrowed to the students.
2. The Loan_id is the primary key which is automatically generated for each new loan.
3. Book_Id references ISBN from the Book table.
4. Card_No references Card_No from the borrower table.
5. Date_out is the date on which the book was issued to the borrower.
6. Due_Date is the date 14 days after the Date_out. This represents the date on which the book is due to be returned to the library. Date_in is the actual date on which the book is returned.

FINES:

1. It contains Loan_id which references Loan_id from Book_loans table.
2. Fine_amt stores the total fine for the loan_id. It is of type decimal with a length of 10 and length of 2 after the decimal.

We have separate Webpages to search the books in the table, update the table when a book is checked in and checked out, add the borrowers in the table and update the table when the fine is charged upon the borrower when the time limit is exceeded and remove the fine when it is paid by the borrower. Also when a borrower is added the database will generate a Card_No which can be used for further operations.