

# Programming Project / C++ – Library Book Management System

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## I. Task Description

**Student 1** is responsible for managing the library's inventory:

- Adding, deleting, modifying books (title, author, quantity)
- Viewing all books in the inventory
- Viewing records of borrowed books

**Student 2** is responsible for interacting with the library system:

- Searching books by title or author
- Adding/removing books from the borrow cart
- Confirming a borrowing, which creates a loan record

## II. Data Structures Used by the Team

The following classes will be used:

- **Book:** string isbn, string title, string author, int quantity
- **Date:** int day, int month, int year
- **Loan:** string user, vector<Book> borrowedBooks, Date loanDate

## III. File Structure

The following files will be used:

**library.txt**

A file where all books in the library inventory are stored in the form:

```
<number_of_books>
<isbn1> <title1> <author1> <quantity1>
...
```

**cart.txt**

A temporary file where the reader's cart is stored:

```
<isbn1> <quantity1>
...
```

**loans.txt**

A file containing all borrowing records:

```
<username> <loan_date>
<isbn1> <quantity1>
<isbn2> <quantity2>
...
```

## IV. Interacting with Executables

**Application 1 (Librarian):**

- `./librarian.exe view_inventory`  
To view all books in the inventory
- `./librarian.exe add_book <isbn> <title> <author> <quantity>`  
To add a new book
- `./librarian.exe delete_book <isbn>`  
To delete a book by ISBN
- `./librarian.exe modify_book <isbn> <new_quantity>`  
To update a book's quantity
- `./librarian.exe view_loans`  
To view all borrowing transactions

**Application 2 (Reader):**

- `./reader.exe search_title <title>`  
To search for books by title
- `./reader.exe search_author <author>`  
To search for books by author
- `./reader.exe add_to_cart <isbn> <quantity>`  
To add a book to the cart
- `./reader.exe remove_from_cart <isbn>`  
To remove a book from the cart
- `./reader.exe view_cart`  
To view books in the cart
- `./reader.exe borrow_books <username>`  
To confirm and record the borrowing