**BOOK MANAGEMENT SYSTEM**

**DESCRIPTION:**

The Book Management System is an easy way to manage logistics in a library digitally. This system allows for users have individual accounts that keep track of the books that they can borrow from the library. They can view status of all the books available in the library, borrow any available book and return the book that they have borrowed. Users can also donate any book to the library which would be available for other users to borrow. New users are required to enter their name and mobile number. They will be provided with a user id which they can use to avail the facilities of the library.

**MODULES USED:**

* Iostream
* String
* Vector

**CLASS DIAGRAM:**

BOOK

+ book\_name: string

+ author: string

+ book\_id: int

+ is\_available: bool

+ Book()

+ Book(int id, string name, string a, bool av)

USER

- user\_id: int

- user\_name: string

- mobile: string

- borrow\_book\_id: int

+ get\_details(): void

+ show\_details(): void

+ borrow\_book(int bid): void

+ return\_book(): void

+ getUser\_id(): int

+ getUser\_name(): string

LIBRARY

# books: static vector<Book>

# tot\_users: static int

+ show\_books(): static void

+ add\_book(): void

+ sort\_book(): void

+ get\_details() = 0: virtual void

**PROGRAM:**

book.h:

#include<iostream>

#include<vector>

#include<string>

**using** **namespace** std**;**

class Book

**{**

public**:**

string book\_name**,** author**;**

int book\_id**;**

bool is\_available**;**

Book**()**

**{**

book\_name **=** ""**;**

author **=** ""**;**

book\_id **=** **-**1**;**

is\_available **=** **false;**

**}**

Book**(**int id**,** string name**,** string a**,** bool av**)**

**{**

book\_id **=** id**;**

book\_name **=** name**;**

author **=** a**;**

is\_available **=** av**;**

**}**

**};**

class Library

**{**

protected**:**

static vector**<**Book**>** books**;**

static int tot\_users**;**

public**:**

static void show\_books**();**

void add\_book**();**

void sort\_books**();**

virtual void get\_details**()** **=** 0**;**

**};**

class User**:** public Library

**{**

string user\_name**,** mobile**;**

int user\_id**,** borrow\_book\_id**;**

public**:**

User**()**

**{**

user\_name **=** ""**;**

mobile **=** ""**;**

borrow\_book\_id **=** **-**1**;**

user\_id **=** **++**tot\_users**;**

**}**

int getUser\_id**();**

string getUser\_name**();**

void get\_details**();**

void show\_details**();**

void borrow\_book**(**int bid**);**

void return\_book**();**

**};**

Bookimp.cpp:

#include "book.h"

void Library**::**show\_books**()**

**{**

cout**<<**"Book ID\tBookName\tAuthor\tAvailable"**<<**endl**;**

cout**<<**"\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n"**;**

**for(**int i **=** 0**;** i **<** books**.**size**();** i**++)**

**{**

cout**<<**books**[**i**].**book\_id**<<**"\t"**<<**books**[**i**].**book\_name**<<**"\t"**<<**books**[**i**].**author**<<**"\t"**;**

**if(**books**[**i**].**is\_available**)**

cout**<<**"Yes\n"**;**

**else**

cout**<<**"No\n"**;**

**}**

**}**

void Library**::**sort\_books**()**

**{**

**for(**int i **=** 0**;** i **<** books**.**size**();** i**++)**

**{**

**for(**int j **=** i**+**1**;** j **<** books**.**size**()-**1**;** i**++)**

**{**

**if(**books**[**i**].**book\_id **>** books**[**j**].**book\_id**)**

**{**

Book temp **=** books**[**i**];**

books**[**i**]** **=** books**[**j**];**

books**[**j**]** **=** temp**;**

**}**

**}**

**}**

**}**

void Library**::**add\_book**()**

**{**

string name**,** author**;**

int id **=** books**.**size**()** **+** 1**;**

cout**<<**"Enter name of the book: "**;**

cin**.**ignore**(**1024**,** '\n'**);**

//cin>>name;

getline**(**cin**,** name**);**

cout**<<**"Enter the name of the author: "**;**

//cin>>author;

cin**.**clear**();**

getline**(**cin**,** author**);**

Book b**(**id**,** name**,** author**,** **true);**

books**.**push\_back**(**b**);**

**this->**sort\_books**();**

**}**

vector**<**Book**>** Library**::**books**;**

int Library**::**tot\_users **=** **-**1**;**

void User**::**get\_details**()**

**{**

cout**<<**"Enter your name: "**;**

cin **>>** user\_name**;**

cout**<<**"Enter your mobile number: "**;**

cin **>>** mobile**;**

cout**<<**"Your user id is: "**<<**user\_id**<<**endl**;**

**}**

void User**::**show\_details**()**

**{**

cout**<<**"User ID: "**<<this->**user\_id**<<**endl**;**

cout**<<**"Name: "**<<this->**user\_name**<<**endl**;**

cout**<<**"Mobile: "**<<this->**mobile**<<**endl**;**

**}**

void User**::**borrow\_book**(**int bid**)**

**{**

**for(**int i **=** 0**;** i **<** books**.**size**();** i**++)**

**{**

**if(**books**[**i**].**book\_id **==** bid**)**

**{**

books**[**i**].**is\_available **=** **false;**

borrow\_book\_id **=** bid**;**

cout**<<**"You have borrowed the following book\n"**;**

cout**<<**books**[**i**].**book\_name**<<**" by "**<<**books**[**i**].**author**<<**endl**;**

**}**

**}**

**}**

void User**::**return\_book**()**

**{**

**if(**borrow\_book\_id **==** **-**1**)**

**{**

cout**<<**"You have no book to return\n"**;**

**return;**

**}**

**for(**int i **=** 0**;** i **<** books**.**size**();** i**++)**

**{**

**if(**books**[**i**].**book\_id **==** borrow\_book\_id**)**

**{**

books**[**i**].**is\_available **=** **true;**

borrow\_book\_id **=** **-**1**;**

cout**<<**"You have returned the following book\n"**;**

cout**<<**books**[**i**].**book\_name**<<**" by "**<<**books**[**i**].**author**<<**endl**;**

**}**

**}**

**}**

int User**::**getUser\_id**()**

**{**

**return** user\_id**;**

**}**

string User**::**getUser\_name**()**

**{**

**return** user\_name**;**

**}**

Bookapp.cpp:

#include "book.h"

int main**()**

**{**

User curr**;**

int ch**;**

vector**<**User**>** users**;**

Library **\***l**;**

**do**

**{**

cout**<<**"\*\*\*\*\*\*The Digital Library\*\*\*\*\*\*\*\n"**;**

cout**<<**"1. Existing User\n"**;**

cout**<<**"2. New User\n"**;**

cout**<<**"3. Exit\n"**;**

cout**<<**"Enter you choice: "**;**

cin **>>** ch**;**

**switch** **(**ch**)**

**{**

**case** 1**:**

**{**

int id**;**

cout**<<**"Please enter your user ID: "**;**

cin **>>** id**;**

int flag **=** 0**;**

**for** **(**int i **=** 0**;** i **<** users**.**size**();** i**++)**

**{**

**if(**id **==** users**[**i**].**getUser\_id**())**

**{**

curr **=** users**[**i**];**

flag **=** 1**;**

**}**

**}**

**if(**flag **==** 0**)**

**{**

cout**<<**"User ID doesn't exist\n"**;**

**break;**

**}**

cout**<<**"\n\nWelcome "**<<**curr**.**getUser\_name**()<<**endl**;**

int choice**;**

**do**

**{**

cout**<<**"1. View available books\n"**;**

cout**<<**"2. Borrow a book\n"**;**

cout**<<**"3. Return a book\n"**;**

cout**<<**"4. Donate a book\n"**;**

cout**<<**"5. Logout\n"**;**

cout**<<**"Enter your choice: "**;**

cin **>>** choice**;**

**switch(**choice**)**

**{**

**case** 1**:**

**{**

curr**.**show\_books**();**

**break;**

**}**

**case** 2**:**

**{**

int bid**;**

cout**<<**"Enter the book id you want to borrow from the list: "**;**

cin **>>** bid**;**

curr**.**borrow\_book**(**bid**);**

**break;**

**}**

**case** 3**:**

**{**

curr**.**return\_book**();**

break;

}

case 4:

{

curr.add\_book();

cout<<"Thank you for donating a book\n";

break;

}

case 5:

{

cout<<"You have signed out\n";

break;

}

}

}while(choice < 5);

break;

}

case 2:

{

User u;

l = (User\*)&u;

l->get\_details();

users.push\_back(u);

break;

}

case 3:

{

cout<<"Exit\n";

break;

}

}

} while (ch < 3);

}

**OUTPUT:**





