CSC 3320 - Mini Library

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Mini Library

Create a system managing a mini library system. The users include borrower and librarian.

Each user corresponds to a record (line) in a text file named "UserInfo.txt". Each record consists of (User ID, First Name, Last Name, Account Name, Password, Role). The role 'B' represents borrower while 'L' represents librarian. Assume users' information have been added to the file "UserInfo.txt" before the execution of the system.

Mini Library - Login

- Login by account name and password
- int findUserByName(char myAccountName[], char myPsw[], User userPool[], int userNum, int bookNum);
  - traverse User userPool[] to find user
  - if found user, return user id;
  - else, printf("Account is not found.");
- When logged in, fetch user type:

       B: borrower → show **borrower menu**

           void BorrowerMenu(char Choice, int bookTotalNum);

       L: librarian → show **librarian menu**

           void LibrarianMenu(char Choice, int bookNum) ;

Scan user's choice and call corresponding functions.

- **Login as librarian:**

```
Enter your account name: Acct3
Enter your password: fffff
Account is found.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
```

- **Login as borrower:**

```
Enter your account name: Acct1
Enter your password: 1234
Account is found.
Borrower Menu:
Enter 'q' for book query by author sorted by book title.
Enter 's' for book status query by name.
Enter 'u' to list books checked out by a given user.
```

Mini Library – Borrower Menu

- **q**: book query by author sorted by book title

- **s**: book status query by name

- **u**: to list books checked out by a given user

Mini Library – Borrower Menu

- **q**: book query by author sorted by book title

  void findBookByAuthor(char *Author, int bookTotalNum);

  TryAgainQ();

  BackToBorrowerMenu();

Mini Library – Borrower Menu

- **s**: book status query by name

    void findBookByName(char *BookName, int bookNum)

    TryAgainS();

    BackToBorrowerMenu();

Mini Library – Borrower Menu

- **u**: to list books checked out by a given user
  int CheckIllegalDate(int yy, int mm, int dd);

  int ListBooksDueDate(int year, int month, int date, int bookNum, char *AccountName);

  TryAgainU();

  BackToBorrowerMenu();

```
Enter your account name: Acct1
Enter your password: 1234
Account is found.
Borrower Menu:
Enter 'q' for book query by author sorted by book title.
Enter 's' for book status query by name.
Enter 'u' to list books checked out by a given user.
q
Please enter Author's name: [FirstName LastName]
J. K. Rowling
Author J. K. Rowling has book(s) below:
Harry Potter and the Philosopher's Stone
Harry Potter and the Chamber of Secrets
Press T for Try again or B for Back to menu
B
Borrower Menu:
Enter 'q' for book query by author sorted by book title.
Enter 's' for book status query by name.
Enter 'u' to list books checked out by a given user.
s
Please enter Book name:
Book1
1 Book1 is in library.
Press T for Try again or B for Back to menu
B
Borrower Menu:
Enter 'q' for book query by author sorted by book title.
Enter 's' for book status query by name.
Enter 'u' to list books checked out by a given user.
u
Date is valid.
2,Book2,Author1,Acct1,2014-10-22,2014-11-21,Over Due
Press T for Try again or B for Back to menu
```
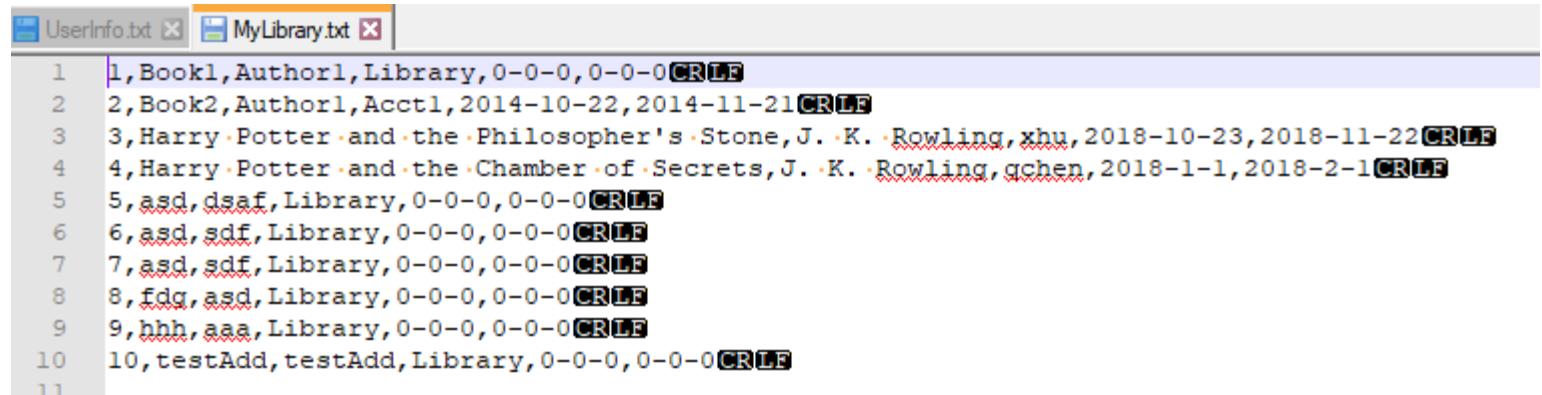
Mini Library – Librarian Menu

- a: add a book into library
- d: to delete a book from library
- o: to check out a book
- r: to return a book
- x: quit

Mini Library – Librarian Menu

- **a**: add a book into library
- void addBook(int userNum, int bookNum);
- ask for book name and author;
- check if input is valid:
  - if valid,
    - create book struct add to book bookPool[];
    - add book info to MyLibrary.txt
    - go back to librarian menu based on user's choice;
  - if invalid, go back to librarian menu based on user's choice;

- **Add book demo:**

```
Enter your account name: Acct3
Enter your password: fffff
Account is found.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
a
Enter book title:
testAdd
Enter author name:
testAdd
Book testAdd is sucessfully added
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
x
```

UserInfo.txt ☒   MyLibrary.txt ☒

```
1    1,Book1,Author1,Library,0-0-0,0-0-0CRLF
2    2,Book2,Author1,Acct1,2014-10-22,2014-11-21CRLF
3    3,Harry Potter and the Philosopher's Stone,J. K. Rowling,xhu,2018-10-23,2018-11-22CRLF
4    4,Harry Potter and the Chamber of Secrets,J. K. Rowling,qchen,2018-1-1,2018-2-1CRLF
5    5,asd,dsaf,Library,0-0-0,0-0-0CRLF
6    6,asd,sdf,Library,0-0-0,0-0-0CRLF
7    7,asd,sdf,Library,0-0-0,0-0-0CRLF
8    8,fdg,asd,Library,0-0-0,0-0-0CRLF
9    9,hhh,aaa,Library,0-0-0,0-0-0CRLF
10   10,testAdd,testAdd,Library,0-0-0,0-0-0CRLF
11
```

Mini Library – Librarian Menu

- **d**: to delete a book from library
- int deleteBook(int userNum, int bookNum);
- ask for book id;
- check if input is valid:
  - if valid,
    - check if book exist;
      - if exist → delete struct book from book bookPool[], shift book in bookPool[];
    - write MyLibrary.txt from book bookPool[];
    - if invalid, go back to librarian menu based on user's choice;
  - if invalid, go back to librarian menu based on user's choice;

- **Delete book demo:**

```
Enter your account name: Acct3
Enter your password: fffff
Account is found.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
d
Please Enter Book ID.
10
Book successfully deleted
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
x
```

```
1,Book1,Author1,Library,0-0-0,0-0-0CRLF
2,Book2,Author1,Acct1,2014-10-22,2014-11-21CRLF
3,Harry Potter and the Philosopher's Stone,J. K. Rowling,xhu,2018-10-23,2018-11-22CRLF
4,Harry Potter and the Chamber of Secrets,J. K. Rowling,qchen,2018-1-1,2018-2-1CRLF
5,asd,dsaf,Library,0-0-0,0-0-0CRLF
6,asd,sdf,Library,0-0-0,0-0-0CRLF
7,asd,sdf,Library,0-0-0,0-0-0CRLF
8,fdg,asd,Library,0-0-0,0-0-0CRLF
9,hhh,aaa,Library,0-0-0,0-0-0CRLF
```

Mini Library – Librarian Menu

- **o**: to check out a book

- int checkOutBook(int userNum, int bookNum, User userPool[]);
- ask for user account name;
- check if input is valid:
  - if valid,
    - find user id by user account name: int userID = findAcct(acct, userPool, userNum, bookNum);
    - traverse bookPool[] to find how many books borrowed by userID;
      - if borrowed less than 3 books, user can borrow book
      - else user can't borrow book, go back to menu;
    - ask for bookID to be borrowed, check if bookID exists in bookPool[];
    - if exists:
      - update book's status = user account name;
      - update book's borrow date = current date;
      - update book's due date = borrow date + 30 days;
      - update MyLibrary.txt
    - else, go back to librarian menu based on user's choice;
  - if invalid, go back to librarian menu based on user's choice;

- **Check out book demo:**

```
Enter your account name: Acct3
Enter your password: fffff
Account is found.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
o
Enter borrower account name
Acct1
Enter Book ID
8
Book Successfully Checked Out.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
x
```

```
1,Book1,Author1,Library,0-0-0,0-0-0CRLF
2,Book2,Author1,Acct1,2014-10-22,2014-11-21CRLF
3,Harry Potter and the Philosopher's Stone,J. K. Rowling,xhu,2018-10-23,2018-11-22CRLF
4,Harry Potter and the Chamber of Secrets,J. K. Rowling,gchen,2018-1-1,2018-2-1CRLF
5,asd,dsaf,Library,0-0-0,0-0-0CRLF
6,asd,sdf,Library,0-0-0,0-0-0CRLF
7,asd,sdf,Library,0-0-0,0-0-0CRLF
8,fdg,asd,Acct1,2018-12-3,2019-1-2CRLF
9,hhh,aaa,Library,0-0-0,0-0-0CRLF
```

Mini Library – Librarian Menu

- **r**: to return a book

- void returnBook(int userNum, int bookNum) ;
- ask for book id and check if book exists;
  - if exists: find user who borrowed the book and fetch user id;
  - check whether current date is over book due date:
    - if overdue, add fine=500 to user's struct User.fine
    - else,:
      - update book.status = library;
      - book.borrowDate = 0-0-0;
      - book.dueDate = 0-0-0;
      - update MyLibrary.txt
  - if doesn't exits: go back to librarian menu based on user's choice;

- **Check out book demo:**

```
Enter your account name: Acct3
Enter your password: fffff
Account is found.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.
r
Enter Book ID.
8
Book fdg successfully check out.
Librarian Menu:
Enter 'a' to add a book into library.
Enter 'd' to delete a book from library.
Enter 'o' to check out a book.
Enter 'r' to return a book.
Enter 'x' to quit.

x
```

```
1,Book1,Author1,Library,null,nullLF
2,Book2,Author1,Acct1,2014-10-22,2014-11-21CRLF
3,Harry Potter and the Philosopher's Stone,J. K. Rowling,xhu,2018-10-23,2018-11-22LF
4,Harry Potter and the Chamber of Secrets,J. K. Rowling,qchen,2018-01-01,2018-02-01CRLF
5,asd,dsaf,Library,null,nullCRLF
6,asd,sdf,Library,null,nullCRLF
7,asd,sdf,Library,null,nullCRLF
8,fdg,asd,Library,2018-12-3,2019-2-1CRLF
9,hhh,aaa,Library,null,nullCRLF
```

```
1,Book1,Author1,Library,0-0-0,0-0-0
2,Book2,Author1,Acct1,2014-10-22,2014-11-21
3,Harry Potter and the Philosopher's Stone,J. K. Rowling,xhu,2018-10-23,2018-11-22
4,Harry Potter and the Chamber of Secrets,J. K. Rowling,qchen,2018-1-1,2018-2-1
5,asd,dsaf,Library,0-0-0,0-0-0
6,asd,sdf,Library,0-0-0,0-0-0
7,asd,sdf,Library,0-0-0,0-0-0
8,fdg,asd,Library,0-0-0,0-0-0
9,hhh,aaa,Library,0-0-0,0-0-0
```

Mini Library – Librarian Menu

- **x**: quit
- return

Mini Library – Future Improvement

- some functions in **<time.h>** library was not supported by Visual Studio;
  - time calculation functions and check time valid function in <time.h> couldn't be used;
  - time_t structure couldn't be implemented;
- **Security:** user password encryption;
- **Algorithm** Time Complexity