Assessment 3

Software Development Process

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1. Problem statement

We are required to construct a relatively complete library management system, and make requirements for the information processing of books and users.

Library management system for book processing requirements: library books cataloging (should be in the order of index). Information about the title of each book (author, title, ISBN, subject, loan type (normal, short loan, non-loan), shelf identification, loan status, number of copies, etc.) should be recorded. The system also needs to provide search function to ensure that any user can find a book.

The system needs to divide the user interface into two types, one is the administrator, the other is the borrower. The administrator will have higher authority and can operate in a deeper level. He can add and edit book information, including marking books as damaged. He can also register new library users, enter information including name, University ID number, telephone number, employee or student identity, book loans, and fees. It can extend the loan term of the borrower's existing loan, print a list of available and borrowed books, and record the return of books by the borrower. For borrowers, they will have the ability to borrow books and edit their personal information, and they will be able to renew their current loans for a predetermined number of times. The interface of the two users must be independent, and the login system and prompt should be set.

In the user interface, we divide it into administrator interface and borrower interface, so that the whole program is divided into two blocks.

The administrator needs to be able to register a new library user and fill in his / her information including name, University ID number, telephone number, employee or student identity, book borrowing and charging. The information registered by the administrator will be stored in a text file and executed by the system. You can delete data from the file by entering the account name. The administrator can view all the information of the borrower, including name, University ID number, telephone number, identity (employee or student identity), book borrowing and fees. We also need to design an interface for borrowers to modify their information by entering their own names. This means that the administrator and the borrower can simultaneously call the data about user information in a linked list.

Managers need to add new book information, which can be queried in the library system. We should create a space to store all the books, and then we need to set up a function to add books so that the administrator can input the information into the system step by step. After adding book information, it is necessary to establish a file function to store book information. Finally, we need to set up a lookup function to verify whether the ISBN code entered by users is compared with the books in the library. If there is a book, the information will be output, including all the information

of the book and its status. Otherwise, the user will be prompted to re-enter the ISBN of the book. In the process of borrowing and returning books, users can find books by book name or book number, check the status of books, and realize the borrowing and returning of books.

2. Analysis

3.

- On an input:

The whole program has two goals, one is the administrator, the other is the borrower.

The administrator interface has 9 options, corresponding to add users, add books, edit user information, edit book information, display all users, display all books, borrow books, return books and exit.

When the add user option is selected, the administrator should enter the name, University ID number, telephone number, identity (faculty or student identity), book borrowing and fees, etc.

When you choose to add a book, you need to enter the author, book name, book number, subject, category, borrowing status, etc.

When the user information needs to be modified, two options will be displayed, one is to change, the other is to delete. When you choose to change the user information, you need to re-enter the user's details, including all the information added in the previous part. If you choose to delete, the user's information will be directly erased.

When you need to modify the book information, there are two options, change and delete. Choosing to change requires re-entry of the book's details, while selecting delete also means erasing the information directly.

When you choose to borrow or return a book, you need to input the book number (ISBN) first. At this time, it will be compared with the data in the database. If it is confirmed to exist, the user will be reminded to enter the name again, and finally complete the whole process of borrowing or returning books.

- On Outputs:

The output part of the whole program is not much, most of it is output prompt. In the case of legal input, according to the classification and selection information mentioned in the input part, when selecting to display all users and displaying all books, the user's name, University ID number, telephone number, identity (teacher or student identity), book borrowing and borrowing fees, or the information and status of books (including book name, book number, author, subject, etc.) will be displayed. If the input is wrong, there will be a prompt.

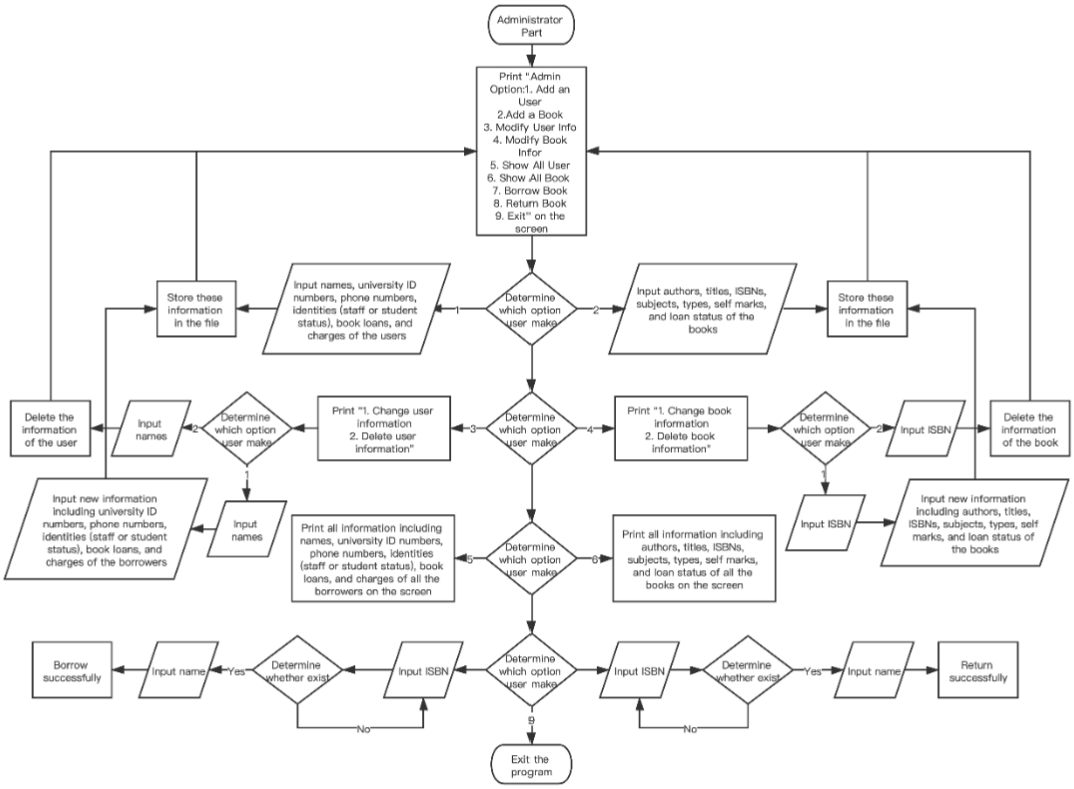
• Data structure:

All input in the program, except option input and coordinate input, is stored in an easy to call array. At the beginning of the program, a structure named user is defined to store the array. The program uses a very wide range of variable types, such as string, character, integer and so on. These variables are used to store information or to calculate or determine the state of the loop. At the same time, many judgment structures are used, such as judging whether the ISBN input by users in the process of book retrieval has corresponding results in the stack, or judging the input number when searching books.

• Algorithm:

The main difficulty of the algorithm is how to store and call the data,

3. Design

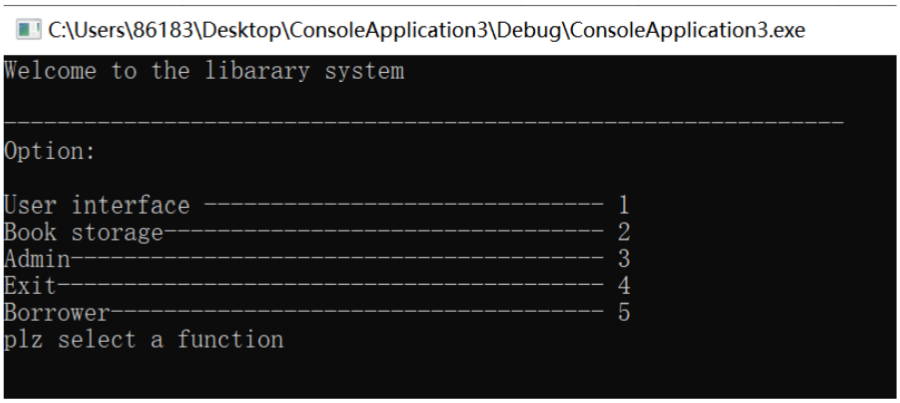


4. Implementation

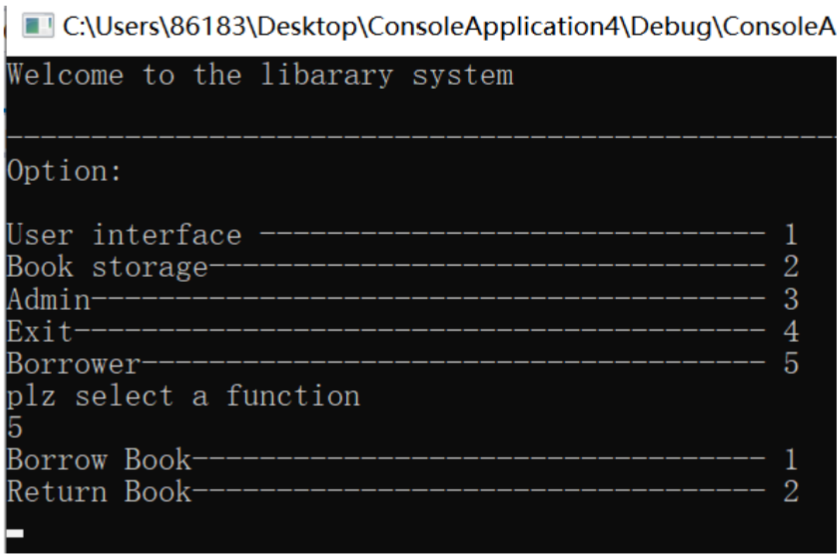
See the C code “Library System.c” with comments.

5. Testing

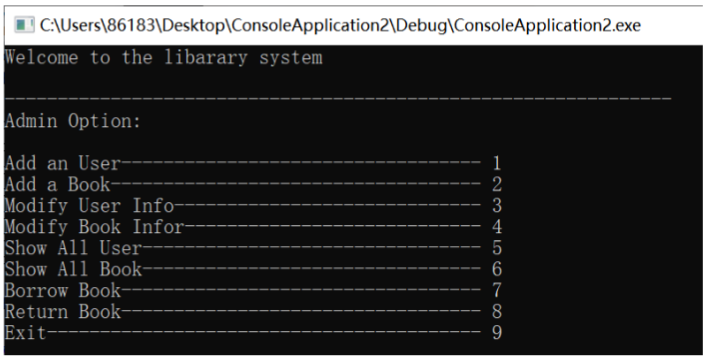
Enter the program, the first is the main interface, we need to select 3 to enter the administrator interface.



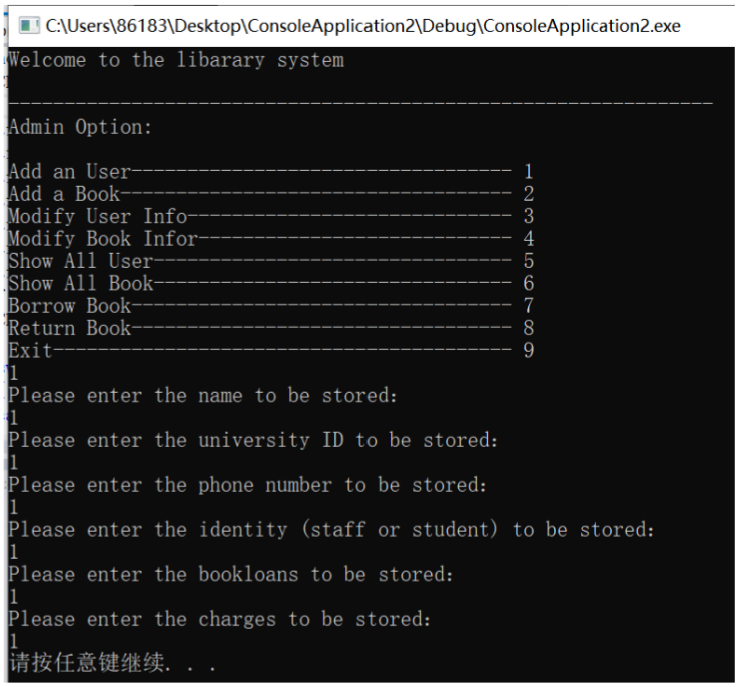
If we select 5 in the main menu, we can enter the borrower page, which has two options: borrowing and returning books.



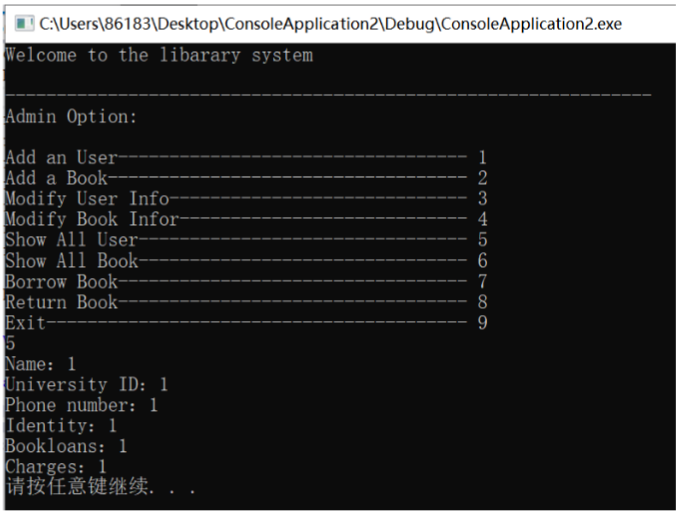
After entering the administrator interface, we can see that there are nine options to choose from: add an user, add books, edit user information, edit book information, show all users, show all books, borrow books, return books and exit.



When you select 1 to add a user, you need to enter the user's name, University ID number, telephone number, identity (faculty or student identity), book borrowing and fees, etc.



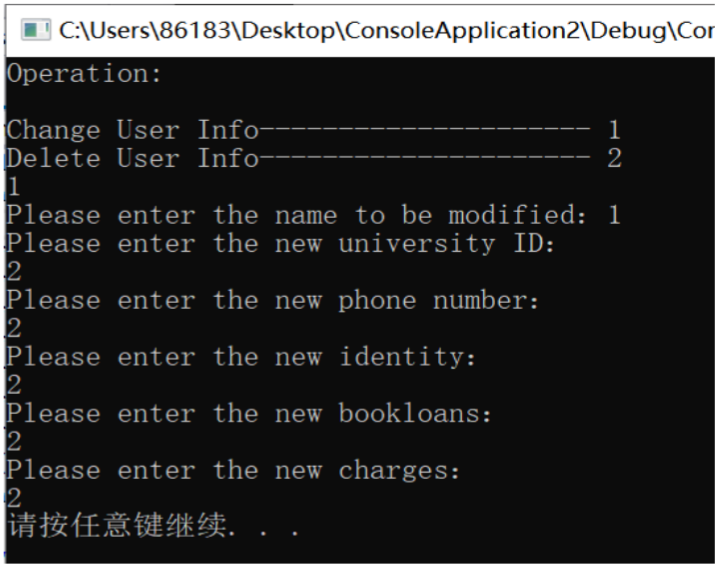
Now that we have entered a user, we can select 5 to view the user. Enter his name and you can see all his information.



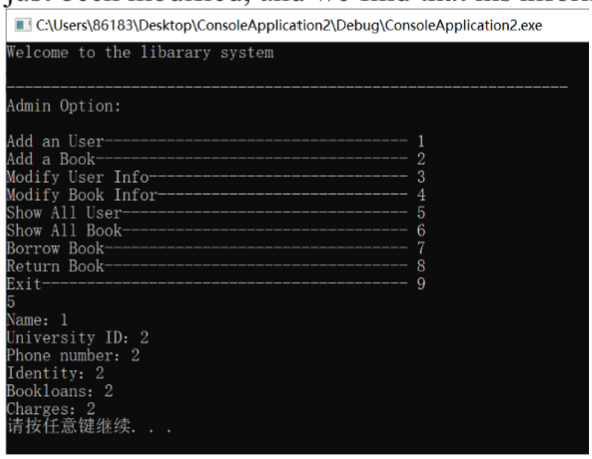
If we want to modify a user's information, we choose 3, modify user information. After entering the interface, there are two options: modify user information and delete user information.

Select 1 to modify user information. The program will ask you to input the name of the user you need to modify, and confirm that after the user is there, you need to

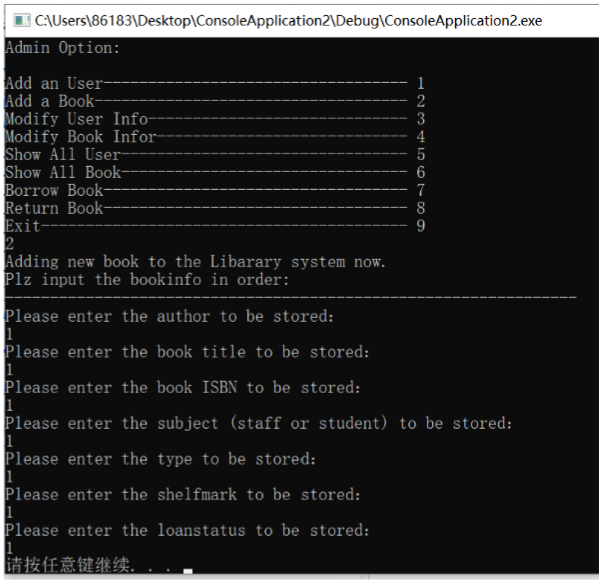
re-enter all his information. If you choose 2 to delete, you will also be asked to enter the user name. After pressing enter, all information of this user will be deleted.



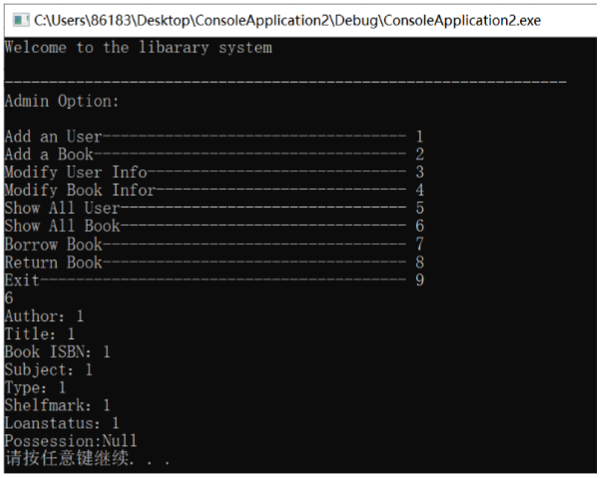
So we select 5 again, display the user information, enter the name of the user who has just been modified, and we find that his information has been changed.



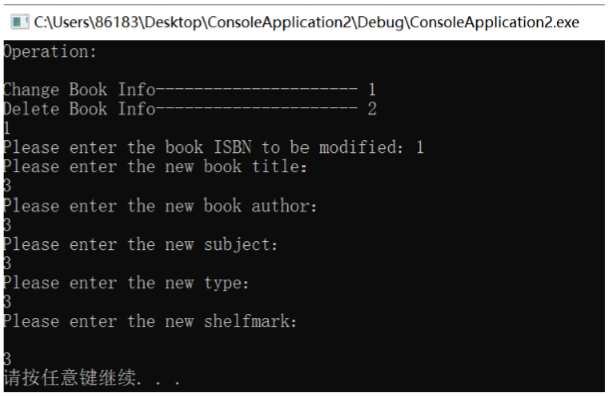
Now we select 2 to add a book. After selection, we need to enter the author, book name, book number, subject, category, borrowing status.



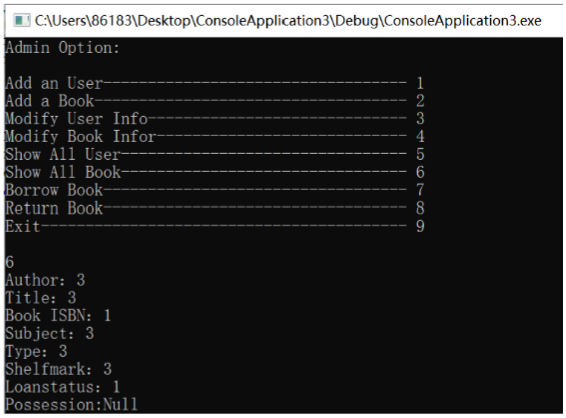
At this time, we choose 6 to display the book information. After inputting the title of the book, we can see all the information of the book.



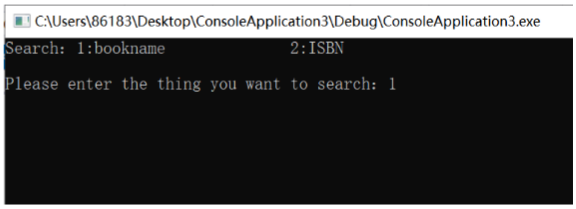
At this time, we choose 4 to change the book information. Just like modifying the user information, we will enter a new interface with two options: modify and delete. If you choose to modify, you will be required to enter the title of the book, and then re-enter all the information of the book. If you choose to delete, you will also be asked to enter the title of the book. After pressing enter, all information of the book will be deleted.



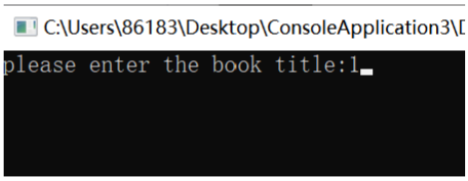
So we choose 6, display the book information, enter the name of the book that has just been modified, and we find that all the information of the book has been changed.



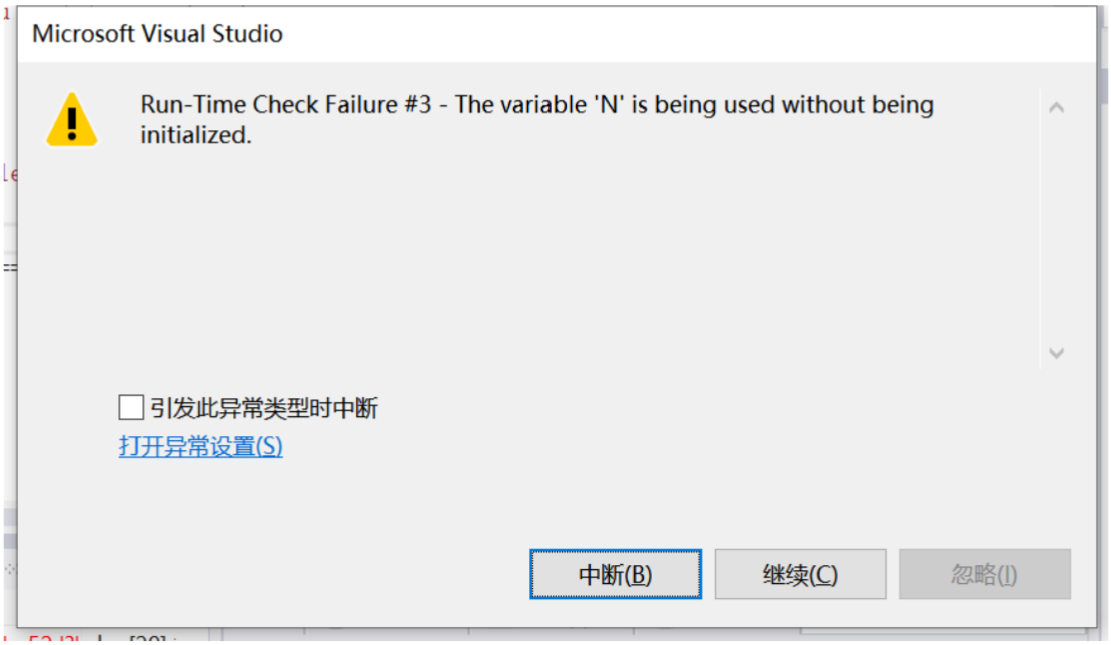
At this time, if we select 7, borrow books, we will enter a new interface. You can choose to input the book name or book number (ISBN), and we can choose to input the book name。



Enter the title of the book.



There are some problems.



Note： The degree of freedom of this program is very high, many places can be free to play. We have found several problems in the program through repeated testing and reflection. First, our program uses arrays to store data, not linked lists. This means that when the program exits, the stored data will no longer exist, and the next time it needs to be re-entered, which means that the program cannot be reused, which is also the most important problem. Second, our borrowing and returning books are not perfect, and we will make mistakes when entering the database. We've tried our best to find the mistake, but it didn't work out in the end. Third, when modifying information, it is not very convenient to modify all the information at one time.

It is true that this is a more difficult programming, but it makes us aware of our lack of knowledge and unskilled application, but our cooperation still helps us overcome many difficulties. The process of learning programming is long and hard. We are willing to learn from practice and constantly improve our ability.