



CP Assignment 3

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Course:	CP
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ASSIGNMENT No. 3
Complex Computing Problem

Course Title: Computer programming

Course Code: CSC-113

Class: BS (CS)-1A,B

Course Instructor: Azeema Sadia

Submission deadline: 11-June -23

Marks: 10

Instructions

1. Students will perform this assignment individually.
2. Assignment should be done only on A4 size paper and will also be uploaded on LMS
3. Deadline will not be extended for any reason.
4. Copied assignments will be marked zero
5. Make a single pdf as both soft copies and hard copy
6. Solution must be designed by applying the following characteristics

Characteristics	Problem Solving description
Depth of analysis required	Has no obvious solution, and requires conceptual thinking and innovative analysis to formulate suitable abstract models
Depth of knowledge required	A solution requires the use of in-depth Computer Programming knowledge provided in class & lab sessions.

Scenario/Problem

Develop a menu driven program in C++ for school library system that facilitates the school students and staff. Students can borrow books from library. The system enable the library staff to keep record of books by entering the correct credentials (login id and password). Your application must prompt a message in case of wrong credential entered. The staff can enter the book in a system with following information one by one.

- Book ID,
- Book Title, and
- Author Name

One book can be issued to the students at most for a month. Students must be 16 years old or above. While issuing a book to the students following information must be stored in a system.

- Student id,
- Name,
- Age,
- Book title,
- Book ISBN
- Duration.

Deliverables

A menu driven program with following functions.

[CLO3, PLO4, BTL C3]

- i. User login
- ii. Taking book record (store into a text file)
- iii. Display particular book information(read from text file and then search specific book)
- iv. Display all books(read from text file)
- v. Issue book to a student(takes reader's information and will store it into a text file)

Add screen shots of your program and output in your solution file

Evaluation Criteria

Deliverables	Evaluation Criteria	Target CLOs
Application for school library (methods and operations)	40%	[CLO3, PLO4, BTL C3]
File Handling	40%	[CLO3, PLO4, BTL C3]
Viva	20%	[CLO2, PLO4, BTL C2]

Code:

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;

int i = 0;
string loginID, loginPassword, bookSearch;
char menuChoice, loopChoice;
ifstream bookin;
ofstream bookout;

//Book
struct book {
    int bookID;
    string bookTitle, authorName;
}bookObj[100];

//Student
struct student {
    int studentID, studentAge, bookISBN, duration;
    string studentName, bookTitle;
}studentObj[100];

void newbookRecord() {
    cout << "===== " << endl
         << "          Enter a new book record" << endl
         << "===== " << endl;

    //taking book record
    cout << "Enter the Book ID" << endl;
    cin >> bookObj[i].bookID;
    cout << "Enter the title of the book" << endl;
    cin.ignore();
    getline(cin, bookObj[i].bookTitle);
    cout << "Enter the Name of the author" << endl;
    getline(cin, bookObj[i].authorName);

    //storing book record in file

    bookin.open("book record.txt");
    bookout.open("book record.txt", ios::app);
    bookout << endl << "===== " << endl
              << "Book ID: " << bookObj[i].bookID << endl
              << "Title: " << bookObj[i].bookTitle << endl
              << "Author: " << bookObj[i].authorName << endl;

    cout << "Book record has been succesfully added to file" << endl;
    bookin.close();
    i = i + 1;
}

void bookrecordSearch() {
    cout << "===== " << endl
         << "          Search for a Book record" << endl
         << "===== " << endl;
    cout << "Enter the ID of the book you want to search for" << endl;
    cin.ignore();
    getline(cin, bookSearch);
}
```

```

bookin.open("book record.txt");
string line, data;
int lineNo = 0;
bool found = false;

//searching for the book by id
while (getline(bookin, line)) {
    if (line.find(bookSearch) != string::npos) {
        cout << "book found!" << endl;
        for (int j = 0; j < 2; j++) {
            getline(bookin, data);
            cout << data << endl;
        }
        found = true;
    }
    lineNo++;
}
if (found = false) {
    cout << "Can't find the book you searched for :(" << endl;
}
bookin.close();
}

void allbookRecord() {
    cout << "===== " << endl
         << "          All Books record";

    string line;
    bookin.open("book record.txt");
    while (getline(bookin, line)) {
        cout << line << endl;
    }
    bookin.close();
}

void studentData() {
    cout << "===== " << endl
         << "          Issue book to a student" << endl
         << "===== " << endl;

    //taking students data
    cout << "Enter Student ID" << endl;
    cin >> studentObj[i].studentID;
    cout << "Enter the Student Name" << endl;
    getline(cin, studentObj[i].studentName);
    cout << "Enter the age of the student" << endl;
    cin >> studentObj[i].studentAge;
    if (studentObj[i].studentAge >= 16) {
        cout << "Enter the title of the book" << endl;
        getline(cin, studentObj[i].bookTitle);
        cout << "Enter the ISBN of the book" << endl;
        cin >> studentObj[i].bookISBN;
        cout << "Enter the duartion period of renting " << endl
             << "(you can rent a book for 30 days at most)" << endl;
        cin >> studentObj[i].duration;
        if (studentObj[i].duration >= 30) {
            cout << "Error: you can only rent a book for 30 days at
most!" << endl;
        }

        //storing student data in file
        ifstream studentin;
        ofstream studentout;
    }
}

```

```

studentin.open("Student data.txt");
studentout.open("Student data.txt", ios::app);

studentout << endl << "=====
<< endl
    << "Student ID: " << studentObj[i].studentID
    << endl << "Student Name: " << studentObj[i].studentName
    << endl << "age of the student: " << studentObj[i].studentAge
    << endl << "title of the book: " << studentObj[i].bookTitle
    << endl << "ISBN of the book: " << studentObj[i].bookISBN
    << endl << "duartion period of renting: " <<
studentObj[i].duration << endl;

    cout << "Student data stored successfully" << endl;
    i = i + 1;
}
else {
    cout << "You can't proceed further as your age is less than 16" <<
endl;
}
}
int main() {

    cout << "===== " << endl
    << "          Welcome To The Library" << endl
    << "===== " << endl;
    cout << "Enter your login id" << endl;
    cin >> loginID;
    cout << "Enter your login password" << endl;
    cin >> loginPassword;

    do {

        if (loginID == "admin" && loginPassword == "admin123") {
            cout << "1. Enter a book record" << endl
                << "2. Display particular book information" << endl
                << "3. Display all books information" << endl
                << "4. Issue a book to a student" << endl;
            cin >> menuChoice;

            if (menuChoice == '1') {
                newbookRecord();
            }

            else if (menuChoice == '2') {
                bookrecordSearch();
            }

            else if (menuChoice == '3') {
                allbookRecord();
            }

            else if (menuChoice == '4') {
                studentData();
            }

        }
        else if (loginID == "admin" && loginPassword != "admin123") {
            cout << "The password you entered is not correct" << endl;

```

```

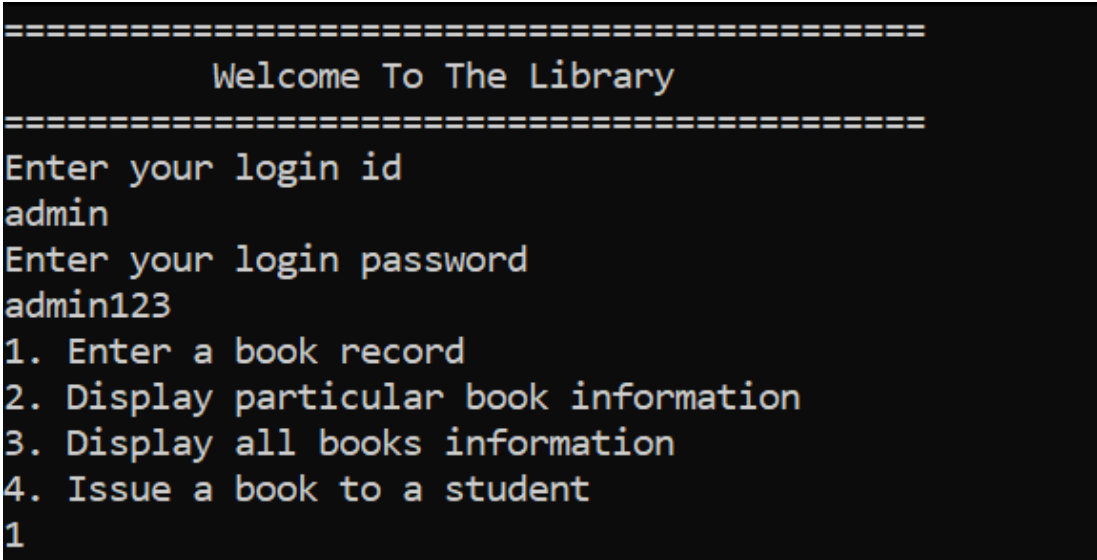
    }
    else if (loginID != "admin" && loginPassword == "admin123") {
        cout << "The login ID you entered is not correct" << endl;
    }
    else {
        cout << "You entered wrong credentials" << endl;
    }
    cout << "Press Y if you want to continue or any other key to exit"
<< endl;
    cin >> loopChoice;
} while (loopChoice == 'y' || loopChoice == 'Y');
return 0;
}

```

Outputs:

1. Login

The login id for admin to log in is “admin” and password is “admin123”, in case of wrong credentials a message will be printed on the console saying “you entered wrong credentials”



```

=====
                Welcome To The Library
=====
Enter your login id
admin
Enter your login password
admin123
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
1

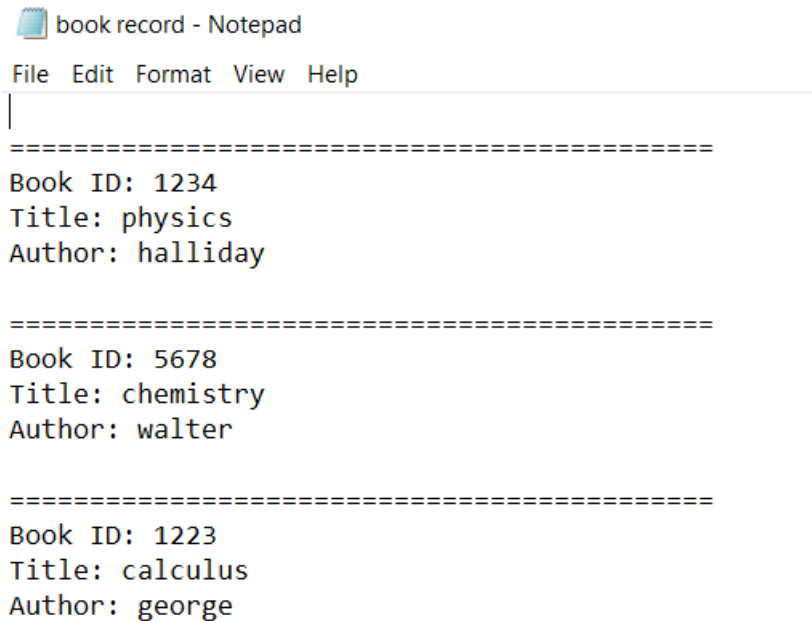
```

2. Entering book records (from console)

Three book records have been entered in the program and there record is also saved in the text file.

```
=====
                        Enter a new book record
=====
Enter the Book ID
1234
Enter the title of the book
physics
Enter the Name of the author
halliday
Book record has been succesfully added to file
Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
1
=====
                        Enter a new book record
=====
Enter the Book ID
5678
Enter the title of the book
chemistry
Enter the Name of the author
walter
Book record has been succesfully added to file
Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
1
=====
                        Enter a new book record
=====
Enter the Book ID
1223
Enter the title of the book
calculus
```


3. Entering book records (in file)



```
book record - Notepad
File Edit Format View Help
=====
Book ID: 1234
Title: physics
Author: halliday

=====

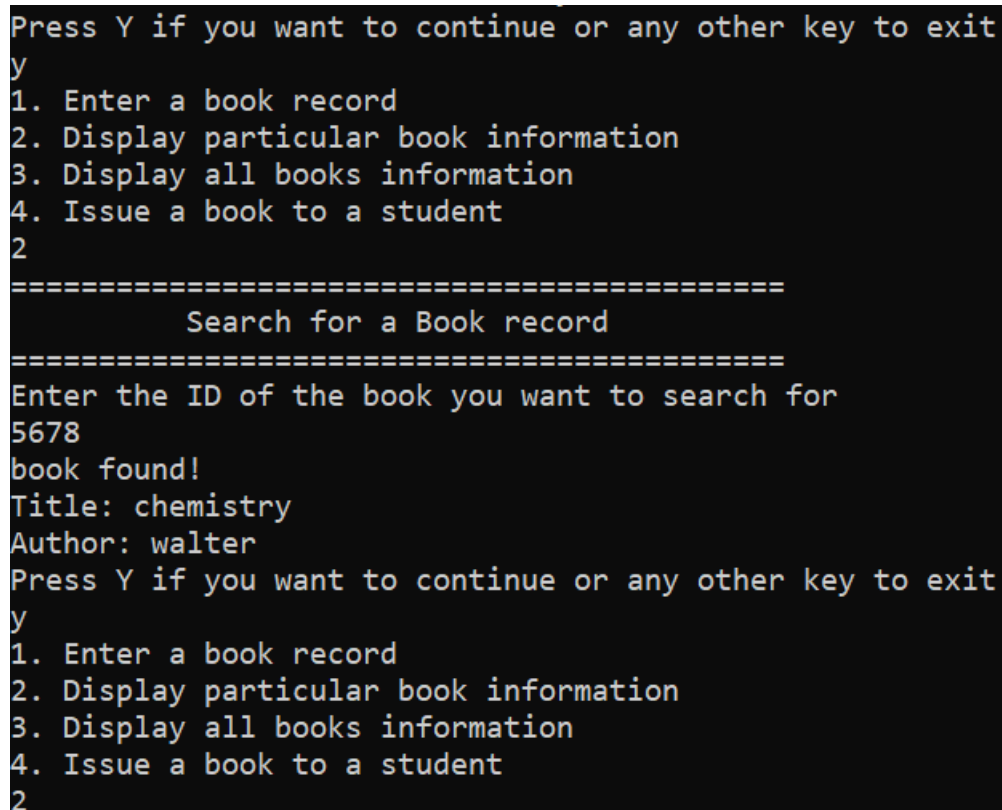
Book ID: 5678
Title: chemistry
Author: walter

=====

Book ID: 1223
Title: calculus
Author: george
```

4. Displaying a particular book record

The books are searched from their ID number and a loop is used to search for the book in the file. After the book is found, its record is displayed on the console from the file.



```
Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
2
=====
                Search for a Book record
=====
Enter the ID of the book you want to search for
5678
book found!
Title: chemistry
Author: walter
Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
2
```

```

=====
                Search for a Book record
=====
Enter the ID of the book you want to search for
1234
book found!
Title: physics
Author: halliday
Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
2
=====
                Search for a Book record
=====
Enter the ID of the book you want to search for
1223
book found!
Title: calculus
Author: george

```

5. Displaying all books record

A loop is used to read the file line by line and then the data is printed on the console.

```

Press Y if you want to continue or any other key to exit
y
1. Enter a book record
2. Display particular book information
3. Display all books information
4. Issue a book to a student
3
=====
                All Books record
=====
Book ID: 1234
Title: physics
Author: halliday

=====
Book ID: 5678
Title: chemistry
Author: walter

=====
Book ID: 1223
Title: calculus
Author: george

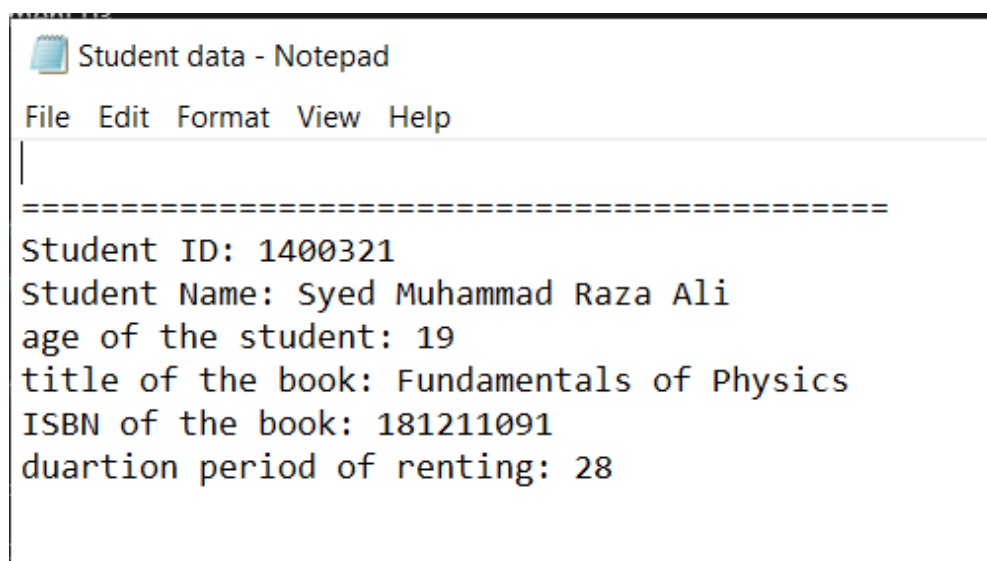
```

6. Issuing a book to a student (Entering data in console)

The data of the student is being stored in the structure and the file.

```
=====
                        Issue book to a student
=====
Enter Student ID
1400321
Enter the Student Name
Syed Muhammad Raza Ali
Enter the age of the student
19
Enter the title of the book
Fundamentals of Physics
Enter the ISBN of the book
181211091
Enter the duartion period of renting
(you can rent a book for 30 days at most)
28
Student data stored successfully
Press Y if you want to continue or any other key to exit
```

7. Issuing a book to a student (in the file)



```
Student data - Notepad
File Edit Format View Help
=====
Student ID: 1400321
Student Name: Syed Muhammad Raza Ali
age of the student: 19
title of the book: Fundamentals of Physics
ISBN of the book: 181211091
duartion period of renting: 28
```