

**CS-218**

**Data Structures Algorithms : Open Ended Lab**

**Library Management System (Raiken)**

**Name : Syed Aali**

**Roll Number : CS-053**

**Submitted To : Miss Ibshar Ishrat**

NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Data Structures & Algorithms (CS-218)

OPEN-ENDED LAB [CLO-3]

SE (CS)

Batch: 2020

Date: 17-01-2022

Implement a library management system having the following functionalities:

- **Add/Remove/Edit book:** To add, remove or modify a book or book item.
  - **Search catalogue:** To search books by title, author, subject or publication date.
  - **Register new account/cancel membership:** To add a new member or cancel the membership of an existing member.
  - **Check-out book:** To borrow a book from the library.
  - **Reserve book:** To reserve a book which is not currently available.
  - **Renew a book:** To reborrow an already checked-out book.
  - **Return a book:** To return a book to the library which was issued to a member
- a. *Implement* and use any sorting algorithm to sort the books on the basis of any attribute ( e.g. book ID, no. of books, author, title etc.).
- b. *Prepare* the complete software (in Python)
- i. Insert at least 15 records in the system
  - ii. Implement the feature to display the whole collection of books

**NOTE**

- i. OEL is on individual basis
- ii. Last date of submission: SUN 6<sup>th</sup> Feb, 2022
- iii. Deliverables: **1.** Program code **2.** List of books **3.** Report
- iv. Total marks: 10 (see the rubrics below)

S.N.	Rubrics	Max Marks	Marks Obtained
1	<i>Implement</i> sorting algorithm	2	
2	<i>Prepare</i> the complete software	4	
3	<i>Prepare</i> the final report	4	

**Ibshar Ishrat**  
Lecturer (CIS)

## How I dealt with the problem:

Since I have done computer programming and object oriented programming in python, I used the concepts that I had learnt in prerequisite courses while solving the problem.

I decided to deal with the most important part of the problem first before everything else which was the name of my library.

The name I chose was “**RAIKEN**”



I decided to create functions first so that I could get something done.

I knew how to approach my problem sufficiently.

I had to revise most of my concepts when it came to doing Object Oriented Programming.

I had to use the help of google and a couple of friends at a lot of places where I felt stuck, for instance in filing and in particular in sorting the books using algorithms we had learnt in DSA.

As I came up with the functionalities of the functions, my code started to come together nicely.

I wish I had more time to have given the Raiken Library the complete look I wanted, but it's okay.

## Driver Code:

After the functions were completed, I decided to make a driver code for my functions that were all called in a while loop which runs infinitely until we decide to exit which is again another option present in the driver code.

Below attached is the screenshot of the driver code for Raiken Library.

```
obj = RaikenLibrary()
while True:
    print('''You have the following options:
        1.) Login to your Raiken Account
        2.) Create a new Raiken account
        3.) Delete your existing Raiken account
        4.) Add book in the Raiken library
        5.) Remove book from the Raiken library
        6.) Edit a book in the Raiken library
        7.) Display all the books in the Raiken library
        8.) Search a particular book in the Raiken Library
        9.) Borrow a book from the Raiken library
        10.) Renew a borrowed book from the Raiken library
        11.) Return a borrowed book to the Raiken library
        12.) Reserve a book from the Raiken library
        13.) Exit the Raiken application''')
```

All these choices have if loops that call the respected functions as needed.

These functions can then be used as long as the user requires.

## List Of Books:

These are the books that were asked for in the OEL

In our OEL we had been asked to show the book list we had used with our library and these are the books that are present in Raiken Library.

```
Gulliver's Travels-Jonathan Swift-5
Mrs. Dalloway-Virginia Woolf-4
The Stories of Anton Chekhov-Anton Chekhov-3
The Stranger-Albert Camus-4
Jane Eyre-Charlotte Bronte-5
The Sun Also Rises-Ernest Hemingway-22
David Copperfield-Charles Dickens-43
Leaves of Grass-Walt Whitman-55
Rabbit Is Rich-John Updike-88
Metamorphoses-Ovid-66
Collected Poems of W. B. Yeats-W. B. Yeats-2
Confess-Colleen Hoover-12
Macbeth-William Shakespeare-90
The Ambassadors-Henry James-23
Confessions of Zeno-Italo Svevo-7
Dracula-Bram Stoker-5
Women in Love-D. H. Lawrence-6
```

In my code we used the hyphens (-) to separate the entries as fields, which are the title, the authors name and the quantity of book copies available for that specific book.

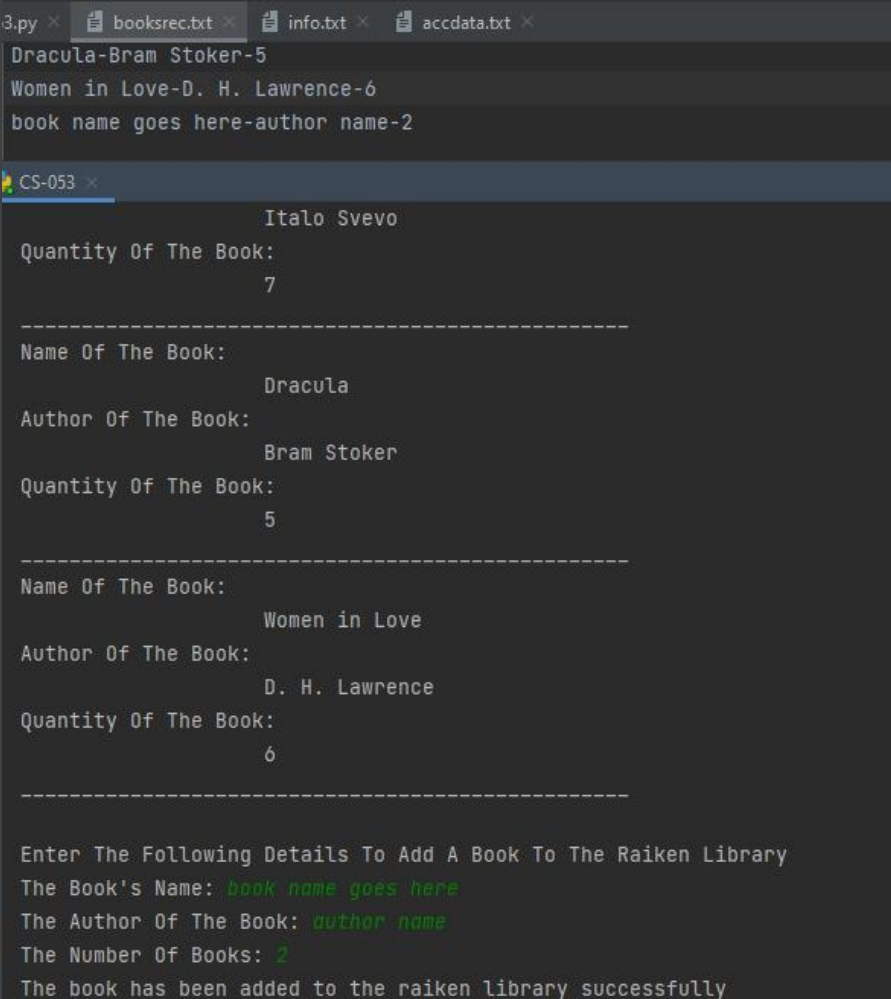
# Functions That The Raiken Library Has:

## 1. Sort\_func

The sort function is where I implement Bubble Sort, A sorting algorithm that sorts the titles of the Books in alphabetical order, as per the requirement of our OEL. This Function is used in the Display Function to display all the available books in the library.

## 2. add\_func

This function adds books to the library by taking input from the user of the Name, Author and No Of Copies of the books and writing them in the text file of the Books.



```
3.py x booksrec.txt x info.txt x accdata.txt x
Dracula-Bram Stoker-5
Women in Love-D. H. Lawrence-6
book name goes here-author name-2

CS-053 x
                Italo Svevo
Quantity Of The Book:
                7

-----
Name Of The Book:
                Dracula
Author Of The Book:
                Bram Stoker
Quantity Of The Book:
                5

-----
Name Of The Book:
                Women in Love
Author Of The Book:
                D. H. Lawrence
Quantity Of The Book:
                6

-----

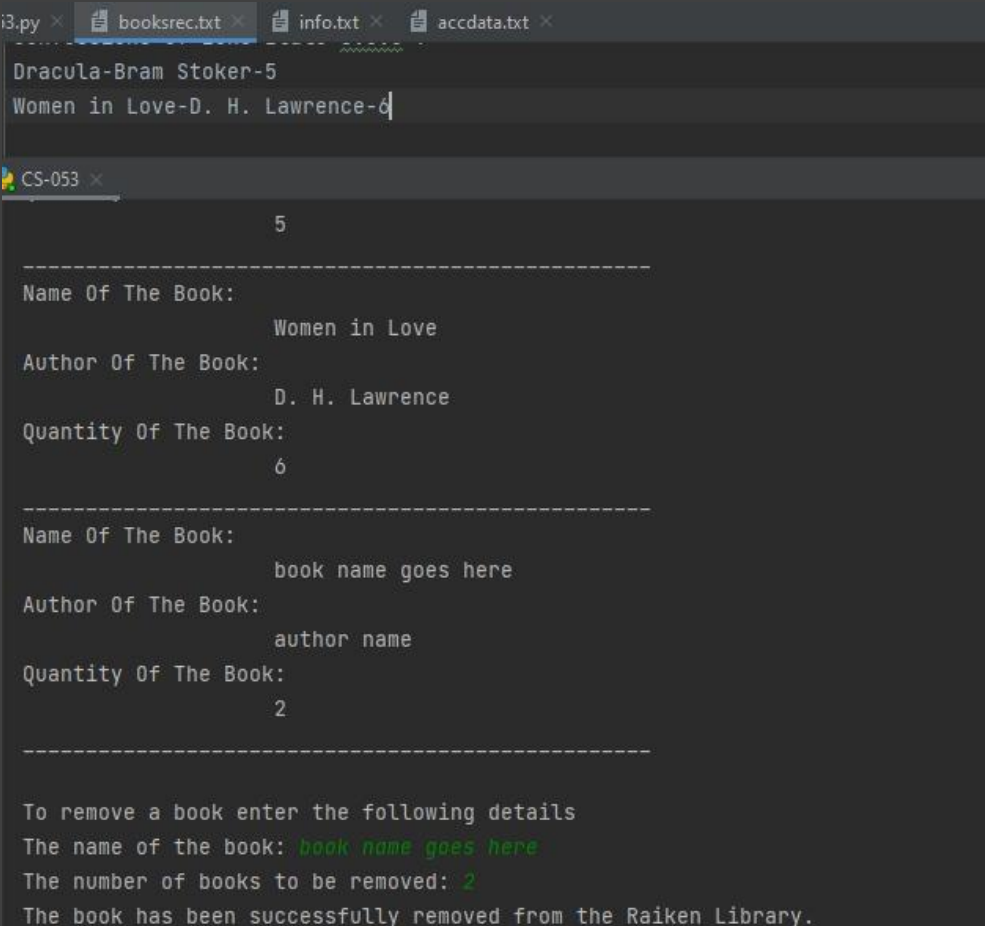
Enter The Following Details To Add A Book To The Raiken Library
The Book's Name: book name goes here
The Author Of The Book: author name
The Number Of Books: 2
The book has been added to the raiken library successfully
```

### 3. Edit\_func

This function allows the user to edit specific fields from a book they have chosen, that can be its Name, Authors Name and the Number of Copies available for the book in the library.

### 4. Remove\_func

This function is used to remove a book from the existing file of books present at the library and it takes input from the user regarding what book it would like to remove.



```
i3.py × booksrec.txt × info.txt × accdata.txt ×
Dracula-Bram Stoker-5
Women in Love-D. H. Lawrence-d

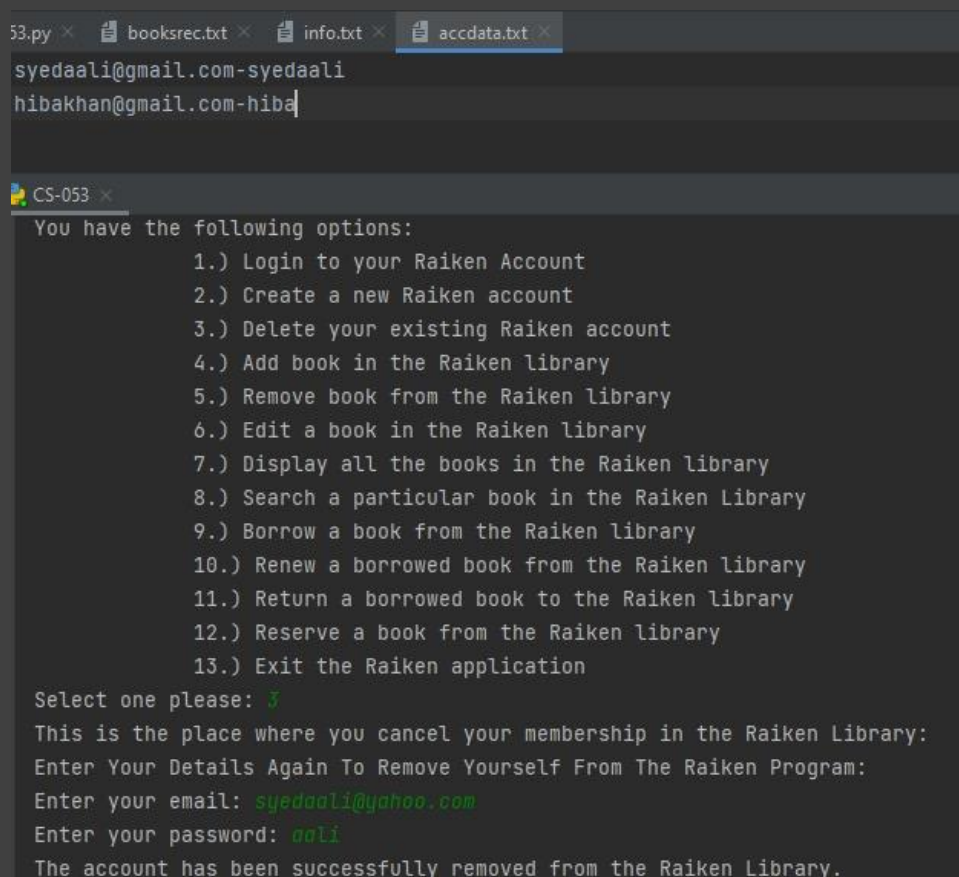
CS-053 ×

5
-----
Name Of The Book:
    Women in Love
Author Of The Book:
    D. H. Lawrence
Quantity Of The Book:
    6
-----
Name Of The Book:
    book name goes here
Author Of The Book:
    author name
Quantity Of The Book:
    2
-----

To remove a book enter the following details
The name of the book: book name goes here
The number of books to be removed: 2
The book has been successfully removed from the Raiken Library.
```

## 5. cancelmember\_func

This function is used to remove a account present in the Raiken Library from the System and it removes the account from the file as well. It takes input from the user on the accounts username and password and checks if such a account is present and then removes it accordingly.



```
53.py x booksrec.txt x info.txt x accdata.txt x
syedaali@gmail.com-syedaali
hibakhan@gmail.com-hiba

CS-053 x
You have the following options:
1.) Login to your Raiken Account
2.) Create a new Raiken account
3.) Delete your existing Raiken account
4.) Add book in the Raiken library
5.) Remove book from the Raiken library
6.) Edit a book in the Raiken library
7.) Display all the books in the Raiken library
8.) Search a particular book in the Raiken Library
9.) Borrow a book from the Raiken library
10.) Renew a borrowed book from the Raiken library
11.) Return a borrowed book to the Raiken library
12.) Reserve a book from the Raiken library
13.) Exit the Raiken application

Select one please: 3
This is the place where you cancel your membership in the Raiken Library:
Enter Your Details Again To Remove Yourself From The Raiken Program:
Enter your email: syedaali@yahoo.com
Enter your password: aali
The account has been successfully removed from the Raiken Library.
```

## 6. Login\_func

This function takes input from the user for their email and password and checks if the user has already made a account in the Raiken Library before or if the account exists in the file. If the account is present it logs him in and presents a logged in to Raiken Library message.



## 7. Show\_all\_books\_func

This function displays all the books present in the Raiken Library by printing all the books present in the file using book name book author and quantity. This calls the sort function to display a sorted list of books

```
CS-053 x
BOOK NAME: Collected Poems of W. B. Yeats
AUTHOR: W. B. Yeats
TOTAL AVAILABLE: 2
*****

BOOK NAME: Confess
AUTHOR: Colleen Hoover
TOTAL AVAILABLE: 12
*****

BOOK NAME: Confessions of Zeno
AUTHOR: Italo Svevo
TOTAL AVAILABLE: 7
*****

BOOK NAME: David Copperfield
AUTHOR: Charles Dickens
TOTAL AVAILABLE: 43
*****

BOOK NAME: Dracula
AUTHOR: Bram Stoker
TOTAL AVAILABLE: 5
*****

BOOK NAME: Gulliver's Travels
AUTHOR: Jonathan Swift
```

BOOK NAME: Jane Eyre  
AUTHOR: Charlotte Bronte  
TOTAL AVAILABLE: 5

\*\*\*\*\*

BOOK NAME: Leaves of Grass  
AUTHOR: Walt Whitman  
TOTAL AVAILABLE: 55

\*\*\*\*\*

BOOK NAME: Macbeth  
AUTHOR: William Shakespeare  
TOTAL AVAILABLE: 90

\*\*\*\*\*

BOOK NAME: Metamorphoses  
AUTHOR: Ovid  
TOTAL AVAILABLE: 66

\*\*\*\*\*

BOOK NAME: Mrs. Dalloway  
AUTHOR: Virginia Woolf  
TOTAL AVAILABLE: 4

\*\*\*\*\*

BOOK NAME: Rabbit Is Rich  
AUTHOR: John Updike

## 8. Search\_func

This function searches for the book in the Raiken Library using its name or the authors name and tells the user if the book is present in the Raiken library or not.

```
booksrec.txt × info.txt × accdata.txt ×
Collected Poems of W. B. Yeats-W. B. Yeats-2
Confess-Colleen Hoover-12
Macbeth-William Shakespeare-90
The Ambassadors-Henry James-23
Confessions of Zeno-Italo Svevo-7
Dracula-Bram Stoker-5
Women in Love-D. H. Lawrence-6

CS-053 ×
12.) Reserve a book from the Raiken Library
13.) Exit the Raiken application
Select one please: 8
Please Choose The Field You'd Like To Search:
1.) Name Of The Book
2.) Author Of The Book
3.) Exit
What is your opt? : 1
Please Enter
The Name Of The Book You Want To Search: Women in Love
Please Choose The Field You'd Like To Search:
1.) Name Of The Book
2.) Author Of The Book
3.) Exit
What is your opt? : 3
BOOK NAME: Women in Love
AUTHOR: D. H. Lawrence
TOTAL BOOKS: 6
```

## 9. checkout\_func

This function basically allows the user to borrow the book the user wants from the Raiken Library and removes the book from the present list of books in the file. It prints checkout next to book, in the list of present books. This calls the login function and logs in the account of whoever is borrowing the book from the Raiken Library, and it also subtracts one from the total number of copies of that book.

```
053.py x booksrec.txt x info.txt x accdata.txt x
email-information-bookname
syeddaali@gmail.com-check_out-Women in Love

CS-053 x
Book Number: 16
                Confessions of Zeno
Author Of The Book:
                Italo Svevo
Quantity Of The Book:
                7
-----
Book Number: 17
                Dracula
Author Of The Book:
                Bram Stoker
Quantity Of The Book:
                5
-----
Book Number: 18
                Women in Love
Author Of The Book:
                D. H. Lawrence
Quantity Of The Book:
                6
-----

Please Enter The Following Details
The Number Of The Book You Want To Borrow: 18
You have borrowed a book from Raiken Library.
```

## 10. Renew\_func

This function allows the user to renew their checkout when the time comes to return or basically extend their period with the book they had previously borrowed from the Raiken Library. This calls the login function and logs in the account of whoever is renewing the book.

```
053.py x booksrec.txt x info.txt x accdata.txt x
syedaali@gmail.com-renew-Dracula
syedaali@gmail.com-renew-Women in Love
email-information-bookname

CS-053 x
You have the following options:
1.) Login to your Raiken Account
2.) Create a new Raiken account
3.) Delete your existing Raiken account
4.) Add book in the Raiken library
5.) Remove book from the Raiken library
6.) Edit a book in the Raiken library
7.) Display all the books in the Raiken library
8.) Search a particular book in the Raiken Library
9.) Borrow a book from the Raiken library
10.) Renew a borrowed book from the Raiken library
11.) Return a borrowed book to the Raiken library
12.) Reserve a book from the Raiken library
13.) Exit the Raiken application
Select one please: 10
This Is The Renew Page.
Please Login Before You Continue
Hello, Please Enter Your Details:
Enter Your Email Please: syedaali@gmail.com
Enter Your Password Please: syedaali
You are now logged in with your account in Raiken Library.
Please Enter
The Name Of The Book You Want To Renew: Dracula
Your Book Has Been Returned
You have renewed a book from Raiken Library.
```

## 11. Reserve\_func

This function allows the user to reserve the book of their liking from the Raiken Library by printing a reserve next to the book they want to reserve in the file. This calls the login function and logs in the account of whoever is reserving the book.

```
syedaali@gmail.com - Raiken Library
email-information-bookname
syedaali@gmail.com-reserve-Reservation Book

CS-053 x
You have the following options.

1.) Login to your Raiken Account
2.) Create a new Raiken account
3.) Delete your existing Raiken account
4.) Add book in the Raiken library
5.) Remove book from the Raiken library
6.) Edit a book in the Raiken library
7.) Display all the books in the Raiken library
8.) Search a particular book in the Raiken Library
9.) Borrow a book from the Raiken library
10.) Renew a borrowed book from the Raiken library
11.) Return a borrowed book to the Raiken library
12.) Reserve a book from the Raiken library
13.) Exit the Raiken application

Select one please: 12
This Is The Reserve Page.
Please Login Before You Continue
Hello, Please Enter Your Details:
Enter Your Email Please: syedaali@gmail.com
Enter Your Password Please: syedaali
You are now logged in with your account in Raiken Library.
Please Enter
The Name Of The Book You Want To Reserve: Reservation Book
You have reserved a book from Raiken Library.
```

## 12. Return\_func

This function returns the book from the user to the Raiken library and basically once the book is returned its details are re added to the file. This calls the login function and logs in the account of whoever is returning the book. This also adds a one to the number of copies if the book is or was present in the list of books.

```
53.py × booksrec.txt × info.txt × accdata.txt ×
email-information-bookname
syedaali@gmail.com-reserve-Reservation Book
CS-053 ×

Welcome To The Raiken Library
You have the following options:
    1.) Login to your Raiken Account
    2.) Create a new Raiken account
    3.) Delete your existing Raiken account
    4.) Add book in the Raiken library
    5.) Remove book from the Raiken library
    6.) Edit a book in the Raiken library
    7.) Display all the books in the Raiken library
    8.) Search a particular book in the Raiken Library
    9.) Borrow a book from the Raiken library
    10.) Renew a borrowed book from the Raiken library
    11.) Return a borrowed book to the Raiken library
    12.) Reserve a book from the Raiken library
    13.) Exit the Raiken application

Select one please: 11
This Is The Return Page.
Please Login Before You Continue
Hello, Please Enter Your Details:
Enter Your Email Please: syedaali@gmail.com
Enter Your Password Please: syedaali
You are now logged in with your account in Raiken Library.
Please Enter
The Name Of The Book You Want To Return: Women in Love
You have returned the book to Raiken Library
```

**Thankyou For Going Over Raiken's Library :))**