



**Faculty of Engineering & Technology
Electrical & Computer Engineering Department**

Linux Laboratory

Project#2- Python Project

Library Management System

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Abstract/Objectives

The aim of this report is to provide a comprehensive theoretical analysis of python code, exploring its key features. Python ,known for its simplicity , readability , and versatility, in this project LMS we became we known- used for python Language.

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Theory

The Library Management System (LMS) is a software application designed to efficiently manage the operations of a library. It provides functionalities such as adding books to the library collection, searching for books, editing book information, archiving books, generating reports, and more. The code provided implements the LMS using Python programming language.

Code Overview: The code consists of two main files: "main.py" and "Library.py". The "main.py" file contains the main program logic, while the "Library.py" file defines the Library class and its methods.

Functionality:

Adding Books to the Library Collection: Users can add books manually by entering book details (title, publisher, ISBN-10, ISBN-13). Users can also add books from a file by specifying the file name. The code reads the file and extracts book information, including any additional information provided.

Searching for Books: Users can search for books within the library collection by entering a search query. The code performs a search based on the title, publisher, ISBN-10, ISBN-13, and additional information of the books. If a match is found, the code displays the book information. Users can choose to save the search results in a wishlist file.

Editing Book Information: Users can edit book information by specifying the book's ISBN-10. The code allows users to modify the title, publisher, ISBN-10, ISBN-13, number of copies, and additional information of the book. Users can either edit the information manually or edit it by providing a file containing the updated information. The code provides options to add the newly edited book to the library collection or update the file only.

Archiving Books: Users can archive books by specifying the book's ISBN-10. If the book has multiple copies, users can choose to archive a specific number of copies or all copies. The code moves the book from the library collection to the archive collection.

Removing Books from the Archive: Users can delete books from the archive collection by specifying the book's ISBN-10.

Generating Reports: The code provides various reports about the books available in the LMS, including the total number of books, the number of different books, the number of archived books, and the number of books newer than a specific year. Additionally, the code generates a book distribution report based on publishers.

Work Done

At first , Data file will be loaded, and books will be printed on the screen:

```
C:\Users\Abdoo\PycharmProjects\LR5\venv\Scripts\python.exe C:/Users/Abdoo/PycharmProjects/LR5/main.py
Data Loaded Successfully!
Title: Linux System Programming: Talking Directly to the Kernel and C Library
Publisher: O'Reilly Media
ISBN-10: 1449339530
ISBN-13: 978-1449339531
Number of copies: 2
Edition : 2
Year : 2013
Month : 1
Language : English
Paperback : 456 pages

Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 3
Year : 1988
Month : 3
Paperback : 272 pages

Title: Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
Publisher: CL-Engineering
ISBN-10: 9780534948221
ISBN-13: 978-0534948221
Number of copies: 1
ASIN : 0534948227
Language : English
Hardcover : 992 pages
```

Figure 1.LoadingData

Then the menu will pop up :

```
*****
-- -- ----- - - - -
| \ / | | _ _ _ | \ | | | | |
| \ / | | _ _ | \ | | | |
| \ / | | _ _ | \ | | | |
| | | | _ _ _ | \ | | | |
| | | | _ _ _ | \ | | | |
| | | | _ _ _ | \ | | | |
*****

1. Adding new books to the library collection
2. Searching for books within the library collection
3. Editing the information of existing books
4. Archiving books
5. Removing books from the LMS
6. Generating reports about the books available in the LMS
7. Exit

Enter Your Choice:
```

Figure 2.Menu

Starting with the first option: 1) The user will be asked to choose between loading a file that contains Books information or adding books manually:

```
Enter Your Choice: 1
1. Add Book Manually
2. Add Books From File
Your Choice: 1
Title: Linux
Publisher: Dr.Aziz
ISBN-10: 123123123
ISBN-13: 123-123213
```

Figure 3.Adding Books (1)

If the user choose option 2: (The file will be checked if it exists or not)

```
Enter Your Choice: 1
1. Add Book Manually
2. Add Books From File
Your Choice: 2
File Name: booksinfo1.txt
The file exists.
Title: Linux System Programming: Talking Directly to the Kernel and C Library
Publisher: O'Reilly Media
ISBN-10: 1449339530
ISBN-13: 978-1449339531
Number of copies: 1
Edition : 2
Year : 2013
Month : 1
Language : English
Paperback : 456 pages

Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 1
Year : 1988
Month : 3
Paperback : 272 pages
```

Figure 4.Adding Books(2)

Secondly, Searching for A book , the user will be asked to enter a parameter , any parameter he likes, for example , any book that has English Language:

```
1. Adding new books to the library collection
2. Searching for books within the library collection
3. Editing the information of existing books
4. Archiving books
5. Removing books from the LMS
6. Generating reports about the books available in the LMS
7. Exit

Enter Your Choice: 2
Enter a data to search About: English
```

Figure 5.Searching (1)

```
Title: Linux System Programming: Talking Directly to the Kernel and C Library
Publisher: O'Reilly Media
ISBN-10: 1449339530
ISBN-13: 978-1449339531
Number of copies: 3
Edition : 2
Year : 2013
Month : 1
Language : English
Paperback : 456 pages

Title: Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
Publisher: CL-Engineering
ISBN-10: 9780534948221
ISBN-13: 978-0534948221
Number of copies: 1
ASIN : 0534948227
Language : English
Hardcover : 992 pages

Title: Modern Computer Architecture and Organization: Learn x86, ARM, and RISC-V architectures and the design of smartphones, PCs, and cloud servers
Publisher: Packt Publishing
ISBN-10: 1803234512
ISBN-13: 978-1803234519
Number of copies: 1
Language : English
Year : 2022
Month : 5
Paperback : 666 pages
```

```
Title: Introductory Circuit Analysis
Publisher: Pearsonn
ISBN-10: 9780133923605
ISBN-13: 978-0133923605
Number of copies: 1
ASIN : 0133923606
Edition : 10
Language : English
Hardcover : 1216 pages
Item Weight : 5.34 pounds

Do You Want to save the Result in WishList File?(y/n)|
```

Figure 6.English Books Search(2)

Then the user will be Asked to save the results in a file ,(will be called WishList.txt)

```
Do You Want to save the Result in WishList File?(y/n)|
```

Figure 7.Saving Search Result(3)

Thirdly, To edit any book , whether it is in a file (not in LMS system) or in LMS system, the user has his choice :

1. Adding new books to the library collection
2. Searching for books within the library collection
3. Editing the information of existing books
4. Archiving books
5. Removing books from the LMS
6. Generating reports about the books available in the LMS
7. Exit

```
Enter Your Choice: 3
```

```
1.Edit by ISBNs
```

```
2.Edit book from file
```

```
Your Choice: |
```

Figure 8. Editing A book (3)

If the users choose to edit by ISBN:

```
Enter Your Choice: 3
```

```
1.Edit by ISBNs
```

```
2.Edit book from file
```

```
Your Choice: 1
```

```
Enter ISBN-10 for a book to edit: 123123123
```

```
BOOK INFO:
```

```
Title: Linux
```

```
Publisher: Dr.Aziz
```

```
ISBN-10: 123123123
```

```
ISBN-13: 123-123213
```

```
Number of copies: 1
```

```
If you Want to keep the parameter as it is press enter space to the specified parameter!
Enter New Book Details
Title: Linux Lap
Publisher:
ISBN-10:
ISBN-13:
Number of Copies: 3
Any Other Information(Enter ALL INFORMATION IF NOT WANTED TO BE EDITED):
```

Figure 9.Edit by ISBN

The other parameters will remain the same.

From file, the user will be asked to enter a file name(will be checked if it exists or not) and its contents will be printed:

```
Enter Your Choice: 3
1.Edit by ISBNs
2.Edit book from file
Your Choice: 2
File Name: BooksInfo1.txt
The file exists.
Title: Linux System Programming: Talking Directly to the Kernel and C Library
Publisher: O'Reilly Media
ISBN-10: 1449339530
ISBN-13: 978-1449339531
Edition : 2
Year : 2013
Month : 1
Language : English
Paperback : 456 pages
```

Figure 10.Edit from File(1)

Then the user will be asked to enter ISBN of the books from file:

```
Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 1
Year : 1988
Month : 3
Paperback : 272 pages

Enter ISBN for a book from a file loaded: 0131103628
Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 1
Year : 1988
Month : 3
Paperback : 272 pages

If you Want to keep the parameter as it is press enter space to the specified parameter!
Enter New Book Details
Title: C Language
Publisher:
ISBN-10:
ISBN-13:
Number of Copies:
Any Other Information(Enter ALL INFORMATION IF NOT WANTED TO BE EDITED):
1.Add NEWLY edited book to LMS
2.Edit File Only
Your Choice: |
```

Figure 11.Edit by file (2)

Then the user will be asked to either to add the edited book to LMS or just keep it in file, will be asked to confirm also:

```
ANY OTHER INFORMATION(ENTER ALL INFORMATION IF NOT WANTED TO BE EDITED):
1.Add NEWLY edited book to LMS
2.Edit File Only
Your Choice: 2
FOR CONFIRMATION ENTER 'Y'|
```

Figure 12.Edit by file(3)

For option 4, Achieving , the user will be asked to enter a ISBN for a A book to archive :

```
Enter Your Choice: 4
Enter ISBN To Achive: 0131103628
Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 4
Year : 1988
Month : 3
Paperback : 272 pages

Print The number Of copies to Archive: |
```

Figure 13.Achieving(1)

About the number of copies:

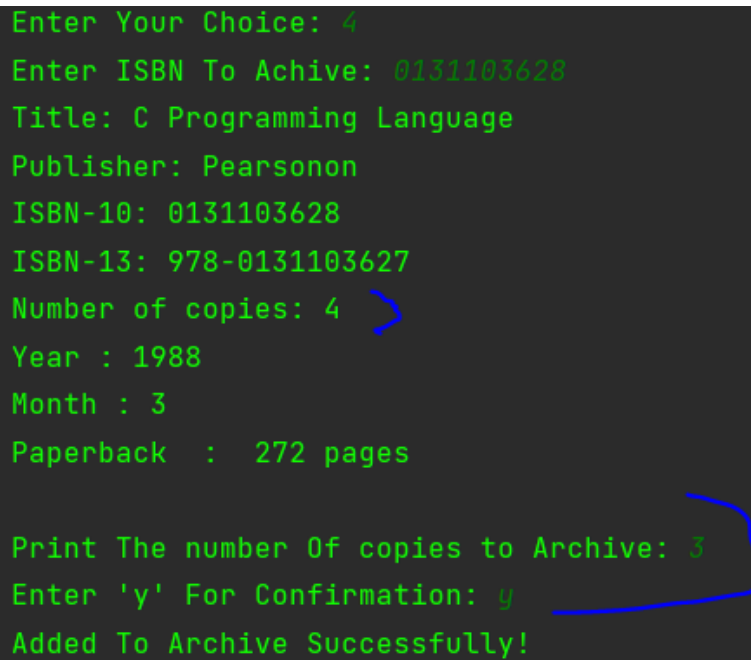
```
for b in self.books:
    if p == b.isbn_10:
        b.info()
        if b.n_copies==1:
            self.books.remove(b)
            self.arc.append(b)
        else:
            n=input("Print The number Of copies to Archive: ")
            if int(n)== b.n_copies:
                c20=input(f"Enter 'y' For Confirmation:NOTE {p} WILL BE REMOVED FROM LMS ")
                if c20.lower() == 'y':
                    self.arc.append(b)
                    self.books.remove(b)
                    print("Added To Archive Successfully!")
            elif int(n)> b.n_copies:
                print("Can not Archive more that the copies!")
            elif int(n)< b.n_copies:
                temp=b.n_copies-int(n)
                b.n_copies=int(n)
                self.arc.append(b)
                b.n_copies=temp
                c20=input("Enter 'y' For Confirmation: ")
                if c20.lower() == 'y':
                    print("Added To Archive Successfully!")
```

Figure 14.Achieving(2)

If the number of copies equals 1 , the book will be archived ,and will be removed from LMS.

If the number of copies is less that the number of copies to be archived , a message will pop out to confront the user that it can't be .

If the number of copies to be archived is less than the number of copies, its possible , a confirmation will be needed and the user will be asked to confirm:



```
Enter Your Choice: 4
Enter ISBN To Achive: 0131103628
Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 4
Year : 1988
Month : 3
Paperback : 272 pages

Print The number Of copies to Archive: 3
Enter 'y' For Confirmation: y
Added To Archive Successfully!
```

Figure 15.Archieving(3)

For the next option, the user will be asked to delete a book, ONLY ARCHIEVED BOOKS.

```
Enter Your Choice: 5
Enter ISBN To Achive: 0131103628
Archived Books:
Title: C Programming Language
Publisher: Pearsonon
ISBN-10: 0131103628
ISBN-13: 978-0131103627
Number of copies: 1
Year : 1988
Month : 3
Paperback : 272 pages

Enter 'y' For Confirmation of Deletion: y
Removed Successfully from Archive
```

Figure 16. Deleting a book

For the report generator: , for book distribution , will find the count of books including copies

```
Enter Your Choice: 6

The Number Of Books in LMS: 10

The Number Of Different books in LMS: 6

The Number of Archived books: 0
Enter A Year : 2000
The Number OF Books Newer Than the Year 2000 are : 2

Book Distrubution By publisher:
O'Reilly Media: 3
Pearsonon: 1
CL-Engineering: 1
Packt Publishing: 1
Pearsonn: 1
Dr.Aziz: 3

Book Distrubution By year:
2013: 3
1988: 1
2022: 1
```

Figure 17. Report

The number of books in LMS : indicated to books and its copies.

The number of different books : indicates to books only.

Number of Archived books are 0, because we deleted it in previous option.

The user will be asked to enter a year, the books that are newer than the year entered will be count'ed .

Book distributed by publisher , each publisher will have the number of books he has in LMS including Number of copies for each book.

Last option , Exit. Data will be saved.

A terminal window with a dark background. The text "Enter Your Choice: 7" is displayed in green monospace font. A vertical cursor is visible at the end of the line.A terminal window with a dark background. The text "Process finished with exit code 1" is displayed in red monospace font. A vertical cursor is visible at the end of the line.

Figure 18.Exit.

Results

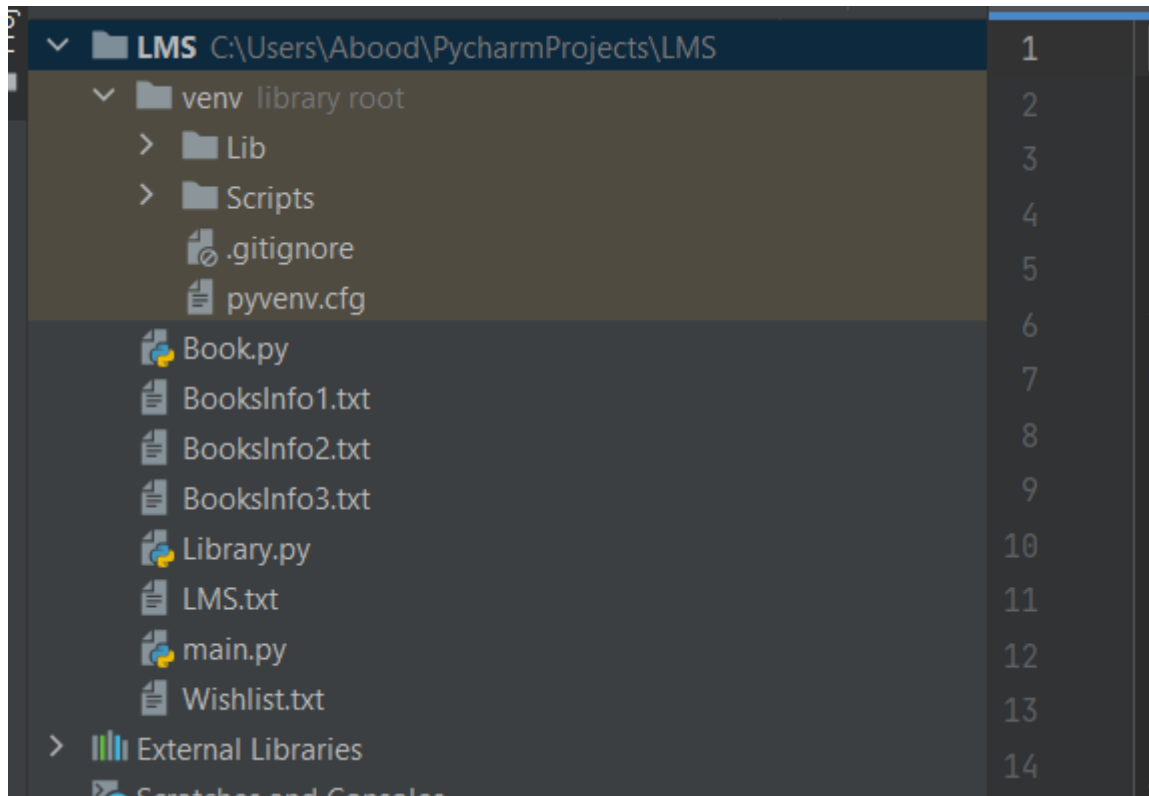


Figure 19.Files

LMS file , and the book we added, this file will be load after opening the project again:

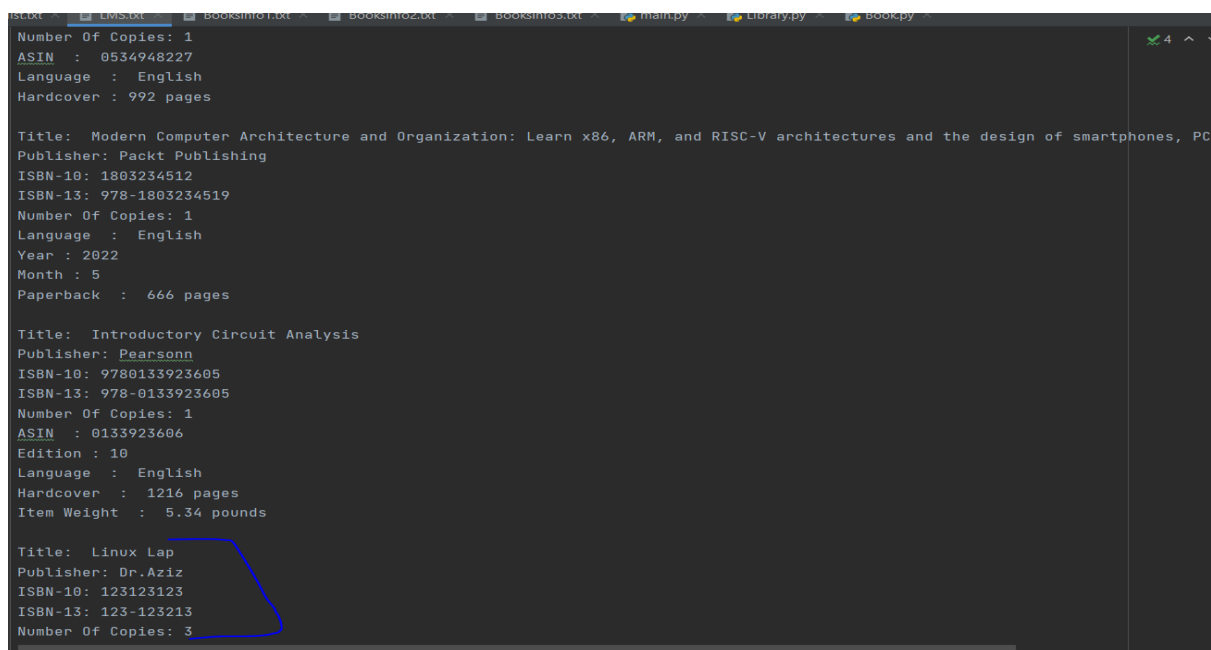
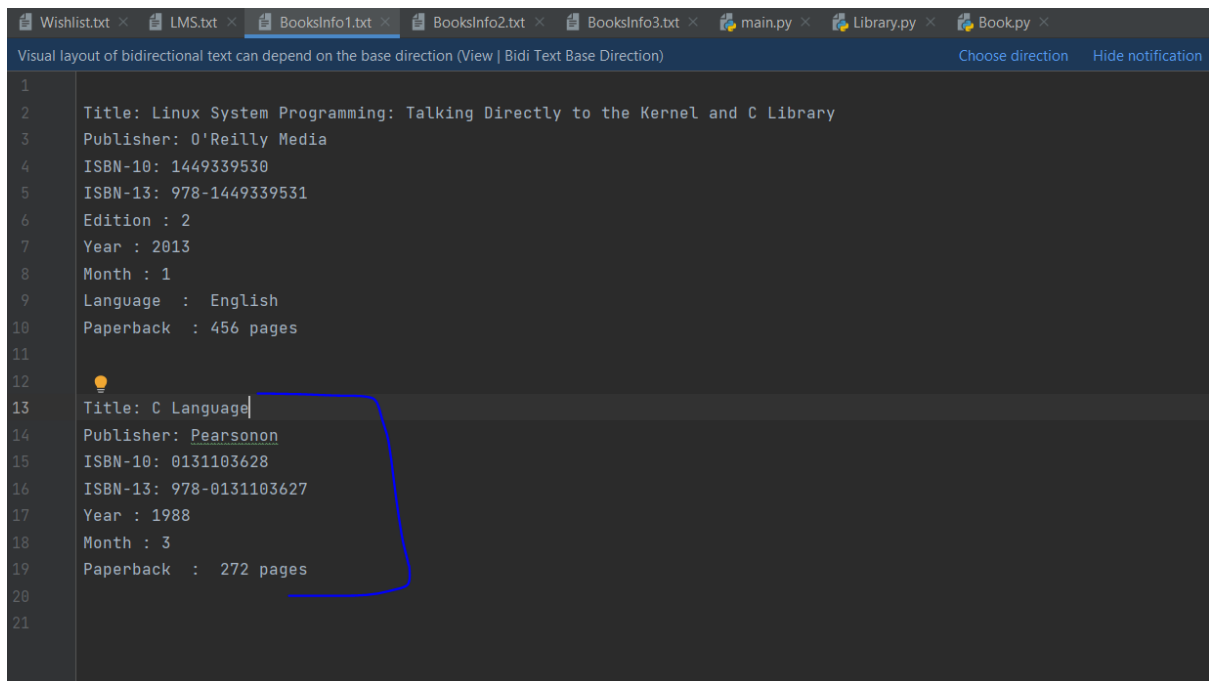


Figure 20.LMS File

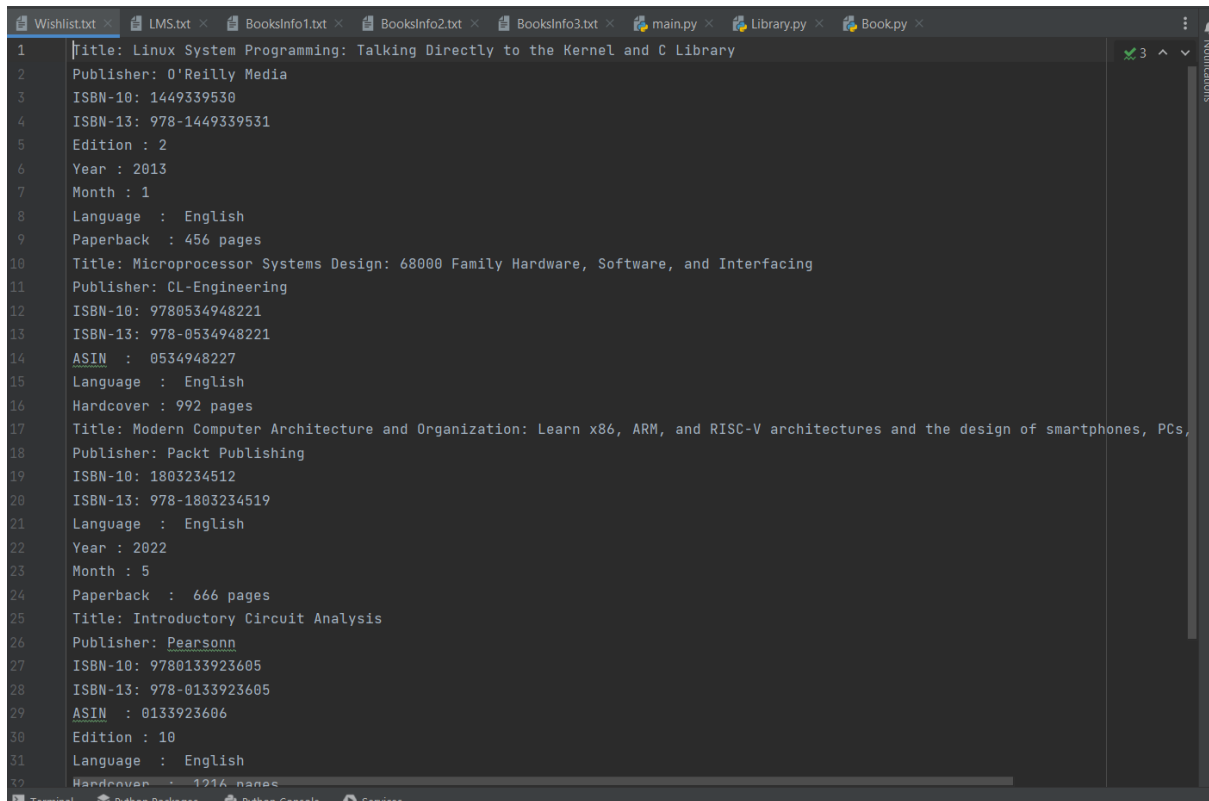
BooksInfo1.txt file that was edited :



```
1
2 Title: Linux System Programming: Talking Directly to the Kernel and C Library
3 Publisher: O'Reilly Media
4 ISBN-10: 1449339530
5 ISBN-13: 978-1449339531
6 Edition : 2
7 Year : 2013
8 Month : 1
9 Language : English
10 Paperback : 456 pages
11
12
13 Title: C Language
14 Publisher: Pearsonon
15 ISBN-10: 0131103628
16 ISBN-13: 978-0131103627
17 Year : 1988
18 Month : 3
19 Paperback : 272 pages
20
21
```

Figure 21.BooksInfo1.txt

Wishlist file that the user saved:



```
1 Title: Linux System Programming: Talking Directly to the Kernel and C Library
2 Publisher: O'Reilly Media
3 ISBN-10: 1449339530
4 ISBN-13: 978-1449339531
5 Edition : 2
6 Year : 2013
7 Month : 1
8 Language : English
9 Paperback : 456 pages
10 Title: Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
11 Publisher: CL-Engineering
12 ISBN-10: 9780534948221
13 ISBN-13: 978-0534948221
14 ASIN : 0534948227
15 Language : English
16 Hardcover : 992 pages
17 Title: Modern Computer Architecture and Organization: Learn x86, ARM, and RISC-V architectures and the design of smartphones, PCs,
18 Publisher: Packt Publishing
19 ISBN-10: 1803234512
20 ISBN-13: 978-1803234519
21 Language : English
22 Year : 2022
23 Month : 5
24 Paperback : 666 pages
25 Title: Introductory Circuit Analysis
26 Publisher: Pearsonn
27 ISBN-10: 9780133923605
28 ISBN-13: 978-0133923605
29 ASIN : 0133923606
30 Edition : 10
31 Language : English
32 Hardcover : 1214 pages
```

Figure 22.WishLish.txt

Modules have been used ,as well as oop:

```
import os  
import re  
from Library import Library  
from Book import Book
```

Figure 23.modules

Conclusion

The implemented Library Management System (LMS) provides a comprehensive set of functionalities for efficiently managing library operations. It allows users to add books, search for books, edit book information, archive books, remove books from the archive, and generate informative reports. The code demonstrates the use of object-oriented programming and file handling techniques to create a user-friendly and efficient LMS.