



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

**Linux Laboratory ENCS3130**

**Project#2 Report**

**Python Project – Library Management System**

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## Introduction

The objective of the Python Library Management System project is to offer a streamlined and well-structured solution for effectively managing library collections. This system empowers users with a range of functionalities, including adding new books, searching for books, editing book information, archiving books, generating reports, and removing books from the library. Its purpose is to enhance the efficiency and organization of library operations.

## The Options

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7):
```

### 1. Adding new books to the library collection

Users can add new books to the library by importing information from a file. The system validates the file's accessibility and formats the data accordingly. Each book is assigned a unique ISBN and an initial copy count.

For example I entered the file BooksInfo2.txt, then print its Information as below:

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 1
Enter the name of the file: BooksInfo2.txt
Book information:
Title: Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
ASIN: 0534948227
Publisher: CL-Engineering;
Language: English
Hardcover: 992 pages
ISBN-10: 9780534948221
ISBN-13: 978-0534948221
*****
Book added to the library successfully.
*****
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;
Language: English
Year: 2022
Month: 5
Paperback: 666 pages
ISBN-10: 1803234512
ISBN-13: 978-1803234519
*****
```

```
*****
ISBN-10: 978-1803234512
*****
Book added to the library successfully.
*****
Title: C Programming Language
Publisher: Pearsonon
Year: 1988
Month: 3
Paperback: 272 pages
ISBN-10: 0131103628
ISBN-13: 978-013110362
*****
Book added to the library successfully.
*****
Title: Introductory Circuit Analysis
ASIN: 0133923606
Publisher: Pearsonn
Edition: 10
Language: English
Hardcover: 1216 pages
ISBN-10: 9780133923605
ISBN-13: 978-0133923605
Item Weight: 5.34 pounds
*****
Book added to the library successfully.
*****
Books loaded from file successfully.
```

Then:

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 1
Enter the name of the file: BooksInfo2.txt
Book information:
Title: Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
ASIN: 0534948227
Publisher: CL-Engineering;
Language: English
Hardcover: 992 pages
ISBN-10: 9780534948221
ISBN-13: 978-0534948221
A book with the same ISBN already exists in the library.
1. Replace existing record
2. Add another copy
Enter your choice (1 or 2): |
```

When I entered 1, it replaced the existing record successfully.

```
1. Replace existing record
2. Add another copy
Enter your choice (1 or 2): 1
Book record replaced successfully.
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;
Language: English
Year: 2022
Month: 5
Paperback: 666 pages
ISBN-10: 1803234512
ISBN-13: 978-1803234519
A book with the same ISBN already exists in the library.
```

When I entered 2 for example, it increase the copy:

```
1. Replace existing record
2. Add another copy
Enter your choice (1 or 2): 2
Another copy of the book added successfully.
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;
Language: English
Year: 2022
Month: 5
Paperback: 666 pages
ISBN-10: 1803234512
ISBN-13: 978-1803234519
Number of Copies: 2
*****
Title: C Programming Language
Publisher: Pearsonon
Year: 1988
Month: 3
Paperback: 272 pages
ISBN-10: 0131103628
ISBN-13: 978-013110362
```

## 2. Searching for books within the library collection

The system provides extensive search functionality, allowing users to locate books based on different criteria such as title, publisher, and ISBN. Users can choose to view the search results on the screen or save them in a text file for future reference.

For example I search for 10, it print all things mentioned 10 and save it to the file named part2.txt.

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 2
Search for books:
Enter the key: 10
Search Results:
Title: Introductory Circuit Analysis
ASIN: 0133923606
Publisher: Pearsonn
Edition: 10
Language: English
Hardcover: 1216 pages
ISBN-10: 9780133923605
ISBN-13: 978-0133923605
Item Weight: 5.34 pounds
Number of Copies: 1
*****
-----
Do you want to store the results in a text file? (yes/no): yes
Enter the file name: part2.txt
Search results stored successfully.
```

BooksInfo2.txt × part2.txt ×	
1	Title: Introductory Circuit Analysis
2	<u>ASIN</u> : 0133923606
3	<u>Publisher</u> : Pearsonn
4	Edition: 10
5	Language: English
6	Hardcover: 1216 pages
7	ISBN-10: 9780133923605
8	ISBN-13: 978-0133923605
9	Item Weight: 5.34 pounds
10	
11	

### 3. Editing the information of existing books

Users have the ability to modify the information of existing books. They can make updates to specific details of a book by entering its ISBN or file name. Before saving the changes, the system requests confirmation from the users.

#### 1- Search using ISBN

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 3
Edit book:
Enter the method you prefer to search:
1. ISBN
2. Title
Enter your choice (1 or 2): 1
Enter the ISBN-10: 0131103628
Enter the ISBN-13: 978-013110362
Book found:
Title: C Programming Language
Publisher: Pearsonon
Year: 1988
Month: 3
Paperback: 272 pages
ISBN-10: 0131103628
ISBN-13: 978-013110362
Number of Copies: 1
*****
```

```
*****
Enter the new information (leave blank to retain old information):
Title: modern c
Publisher: mahanad
Year: 2010
Month: 5
Paperback: 67
ISBN-10: 43
ISBN-13: 11
You have made changes. Do you want to save them? (yes/no): yes
Book information updated successfully.
```

## 2- Search Using Title

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 3
Edit book:
Enter the method you prefer to search:
1. ISBN
2. Title
Enter your choice (1 or 2): 2
Enter the title: Introductory Circuit Analysis
Book found:
Title: Introductory Circuit Analysis
ASIN: 0133923606
Publisher: Pearsonn
Edition: 10
Language: English
Hardcover: 1216 pages
ISBN-10: 9780133923605
ISBN-13: 978-0133923605
Item Weight: 5.34 pounds
Number of Copies: 1
*****
```

```
*****
Enter the new information (leave blank to retain old information):
Title: ICA
ASIN: 123
Publisher: ahmad
Edition: 2
Language: arabic
Hardcover: 100
ISBN-10: 1231
ISBN-13: 129
Item Weight: 6 pounds
You have made changes. Do you want to save them? (yes/no): yes
Book information updated successfully.
```



#### 4. Archiving books

Users are provided with the capability to archive infrequently used books using the system. By selecting books based on their ISBNs, users can specify the number of copies to be archived. Before proceeding with the archiving process, confirmation is necessary to ensure accuracy.

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 4
Enter the ISBN-10 of the book to archive: 1803234512
Enter the ISBN-13 of the book to archive: 978-1803234519
Are you sure you want to archive this book? (yes/no): yes
Book archived successfully.
```

#### 5. Removing books from the LMS

Users have the authority to remove books from the Library Management System. However, only archived books are eligible for deletion. Before a book is removed, confirmation is sought from the user to ensure the intentional removal of the book.

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 5
Remove book:
Enter the ISBN-10 of the book to remove: 1803234512
Enter the ISBN-13 of the book to remove: 978-1803234519
Are you sure you want to remove this book? (yes/no): yes
Book removed successfully.
```

## 6. Generating reports about the books available in the LMS.

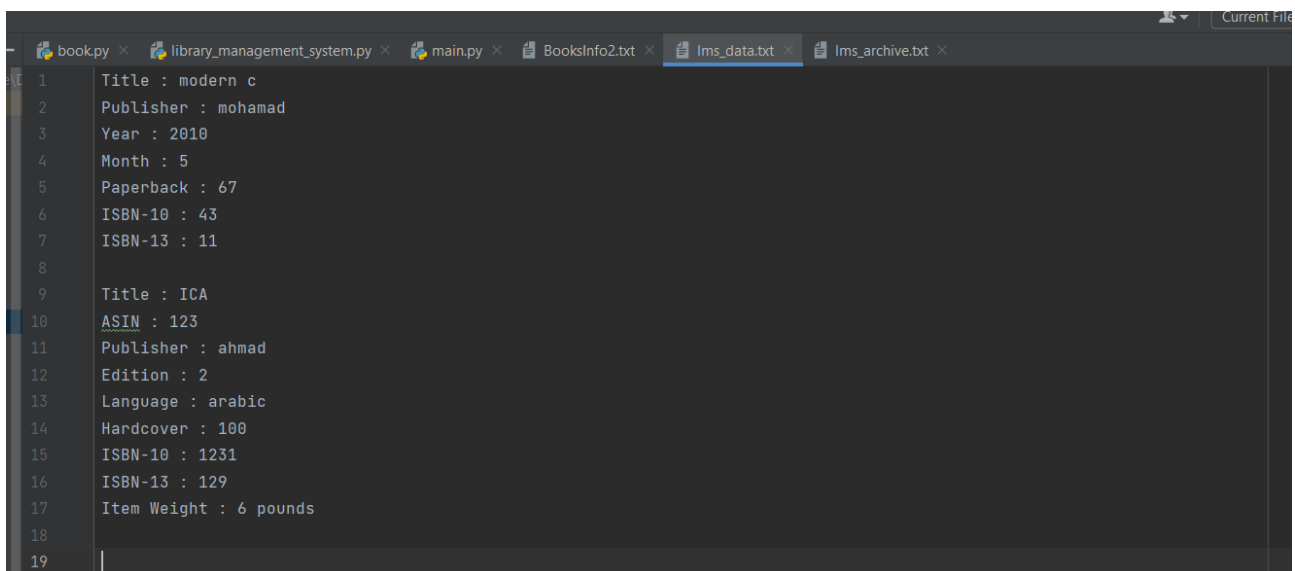
The system offers a range of reports that provide valuable insights into the library's collection. These reports encompass the total number of books, the count of unique books, the number of archived books, the distribution of books by year and publisher, as well as the count of books published more recently than a specified year. These reports serve as valuable tools for understanding and analyzing the library's collection in a comprehensive manner.

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 6
Enter a year to find the number of books that are newer: 2010
Total books in LMS: 2
Total unique books in LMS: 2
Total books archived: 1
Number of books newer than 2010: 0
Books distribution by the publisher:
    number of books from mohamad:1
    number of books from ahmad:1
Books distribution by year:
    number of books in 2010:1
```


## 7. Exit

Upon selecting the exit option, the system ensures that all book data is saved to a designated LMS file. This file is automatically loaded when the system is launched for subsequent sessions, ensuring the preservation and accessibility of the previously saved data.

```
Library Management System
1. Add new books to the library collection
2. Search for books within the library collection
3. Edit the information of existing books
4. Archive books
5. Remove books from the LMS
6. Generate reports about the books available in the LMS
7. Exit
Enter your choice (1-7): 7
Library Management System terminated. Books data saved to file: lms_data.txt
Library Management System terminated. Books data saved to file: lms_archive.txt
```



```
bookpy × library_management_system.py × main.py × BooksInfo2.txt × lms_data.txt × lms_archive.txt ×
1 Title : modern c
2 Publisher : mohamad
3 Year : 2010
4 Month : 5
5 Paperback : 67
6 ISBN-10 : 43
7 ISBN-13 : 11
8
9 Title : ICA
10 ASIN : 123
11 Publisher : ahmad
12 Edition : 2
13 Language : arabic
14 Hardcover : 100
15 ISBN-10 : 1231
16 ISBN-13 : 129
17 Item Weight : 6 pounds
18
19 |
```



```
bookpy × library_management_system.py × main.py × BooksInfo2.txt × lms_data.txt × lms_archive.txt ×
1 Title : Microprocessor Systems Design: 68000 Family Hardware, Software, and Interfacing
2 ASIN : 0534948227
3 Publisher : CL-Engineering;
4 Language : English
5 Hardcover : 992 pages
6 ISBN-10 : 9780534948221
7 ISBN-13 : 978-0534948221
8
9 |
```

## Summary

The Python Library Management System serves as a comprehensive solution that optimizes library operations, enhances book management, simplifies search processes, facilitates data editing, enables efficient archiving, generates informative reports, and ensures data persistence for future use. By leveraging this system, libraries can significantly improve their efficiency, provide enhanced services to patrons, and maintain a well-organized collection of books.