

Structured Programming

CST-121-3

# MINI PROJECT

CST-TEAM-03

# DIGITALIZED LIBRARY SYSTEM

Department of Computer Science and Informatics

Uva Wellassa University

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# Contents

<b>01 . Introduction.....</b>	<b>3</b>
<b>02 . Problems.....</b>	<b>3</b>
<b>03 . Scenario.....</b>	<b>4</b>
<b>04 . Solution.....</b>	<b>4</b>
<b>05 . Flowchart &amp; Psuedo Code.....</b>	<b>5</b>
<b>06 . Source Code.....</b>	<b>15</b>
<b>07 . Output.....</b>	<b>21</b>
<b>08 . Conclusion.....</b>	<b>26</b>
<b>09 . Reference.....</b>	<b>26</b>
<b>10 . Risk Management.....</b>	<b>27</b>
<b>11 . Future Enhancement.....</b>	<b>27</b>
<b>12 . Individual Contribution.....</b>	<b>28</b>

## **01 . INTRODUCTION**

The main objective of this program is to manage the books available in a library. This software helps to know information about books available in a library, books taken out from the library, books brought in and many other information. High quality managing system with high security and the overall requirements of an organizations are achieved by this system.

Observation :

1. Saves time and reduces human intervention.
2. The system is flexible ,Secured and easy to be used.
3. Unique Identification of books through Book name and Book Id.
4. Increasing number of Books as individuals will use it easier to manage their library.
5. Managing the Library activities with a friendly digital interface.
6. No books will be theft.

## **02 . PROBLEM**

We conducted a survey to specifically identify the problem in the real world. We conducted this survey within Library on the book managing system.

The result of the survey was the rate for current book management method is very low and the rate for digitalized book management system is high. So, we came up with a conclusion to rectify this problem using a digitalized book Management system.

The digitalized book management system for Libraries. Which we assumed this as the solution for this problem.

### **03 . SCENARIO**

In a physical record maintenance system, when a student needs to borrow a book, they are required to show the book to the counter. Afterward, the assistant enters the book's details into a record book and also adds the borrower's details. If the borrower fails to return the book, it becomes challenging to find the details of the lost book. Furthermore, when the borrower returns the book, the assistant needs to search for the details, locate the information, and mark the returned book accordingly.

### **04 . SOLUTION**

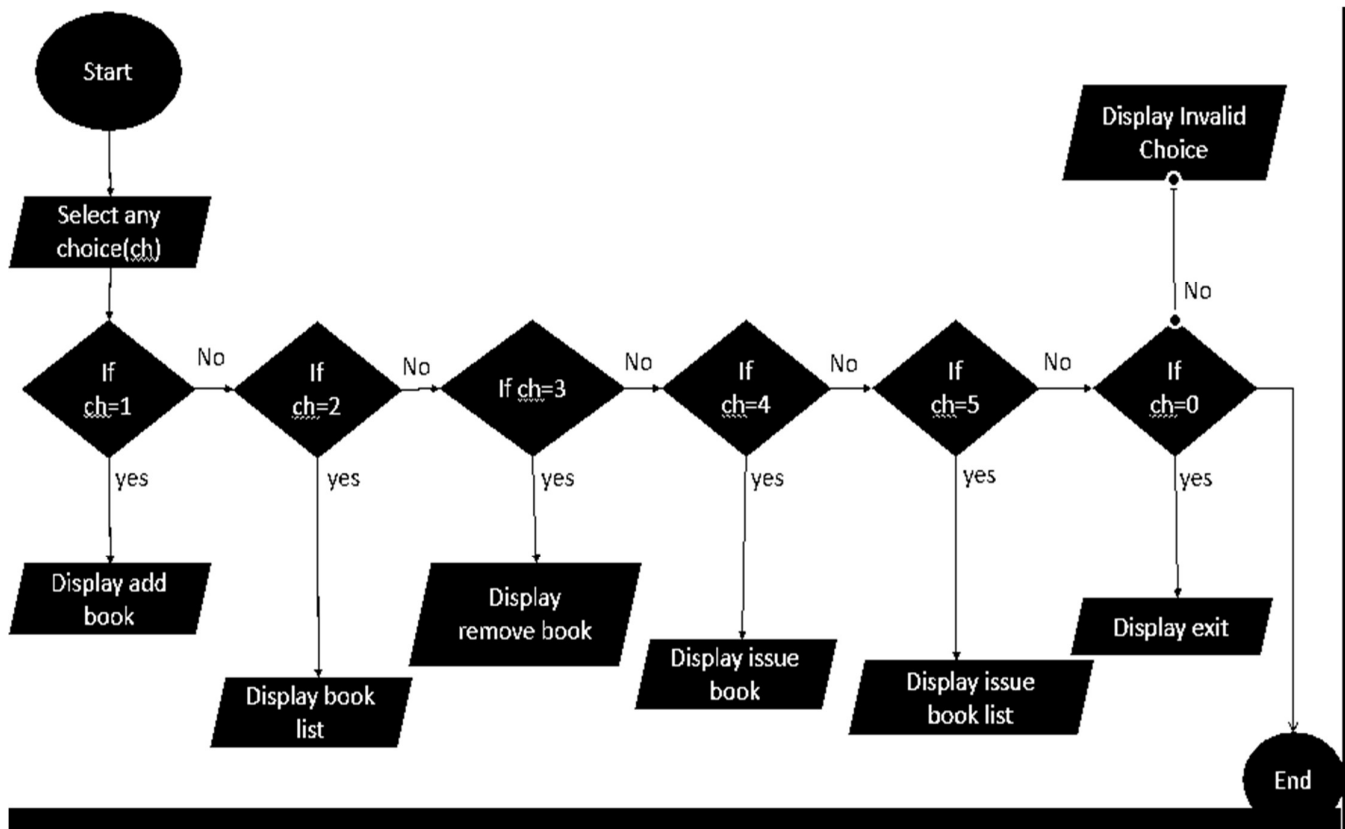
As a solution to these challenges, our system will store the details of books along with the borrowing information. Adding borrower details will be simplified, and retrieving information about borrowed books will be as easy as inserting the book ID.

The system also includes.

- Adding new records.
- Removing old records .
- View the list of records etc...

## 05 . FLOWCHART & PSUEDO-CODE

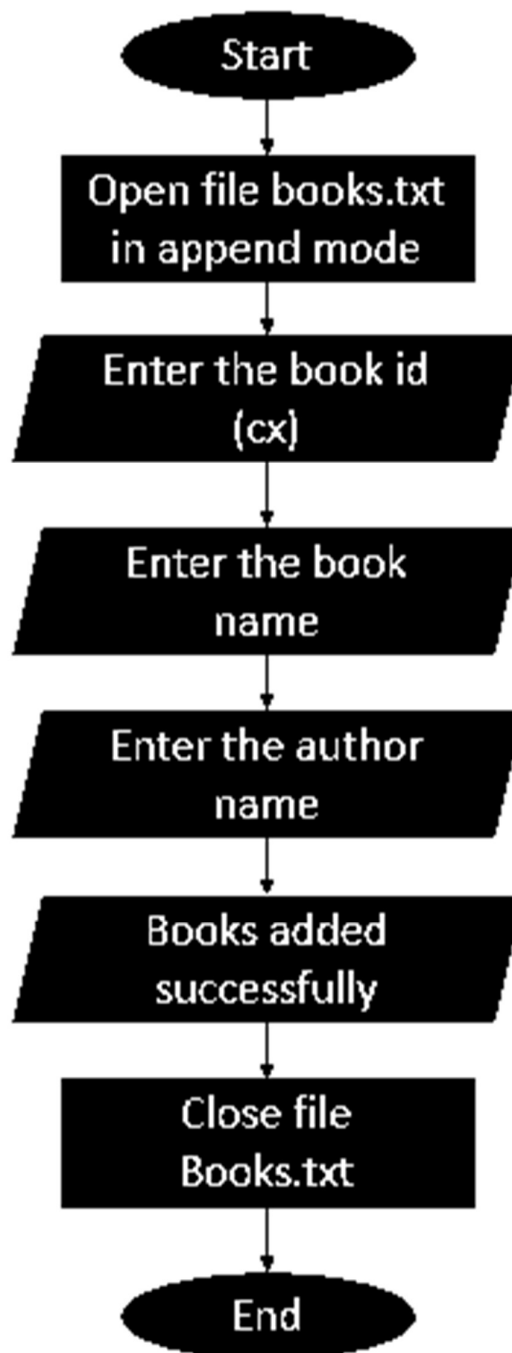
- MAIN FUNCTION



## MAIN FUNCTION PSUEDO CODE

```
1)  START
2)  DECLARE integer variable ch
3)  WHILE true DO
4)  DISPLAY "Library Management System "
5)  DISPLAY "1. Add Book"
6)  DISPLAY "2. Books List"
7)  DISPLAY "3. Remove Book"
8)  DISPLAY "4. Issue Book"
9)  DISPLAY "5. Issued Book List"
10) DISPLAY "0. Exit"
11) DISPLAY "Enter your choice: "
12) READ user input into ch
13) SWITCH on ch
14) CASE 0:
    EXIT program
15) CASE 1:
    CALL addBook function
    BREAK
16) CASE 2:
    CALL booksList function
    BREAK
17) CASE 3:
    CALL del function
    BREAK
18) CASE 4:
    CALL issueBook function
    BREAK
19) CASE 5:
    CALL issueList function
    BREAK
20) DEFAULT:
    DISPLAY "Invalid Choice..."
21) END SWITCH
22) DISPLAY "Press Any Key To Main menu..."
23) GET character input using getch()
```

- ADD BOOK FUNCTION

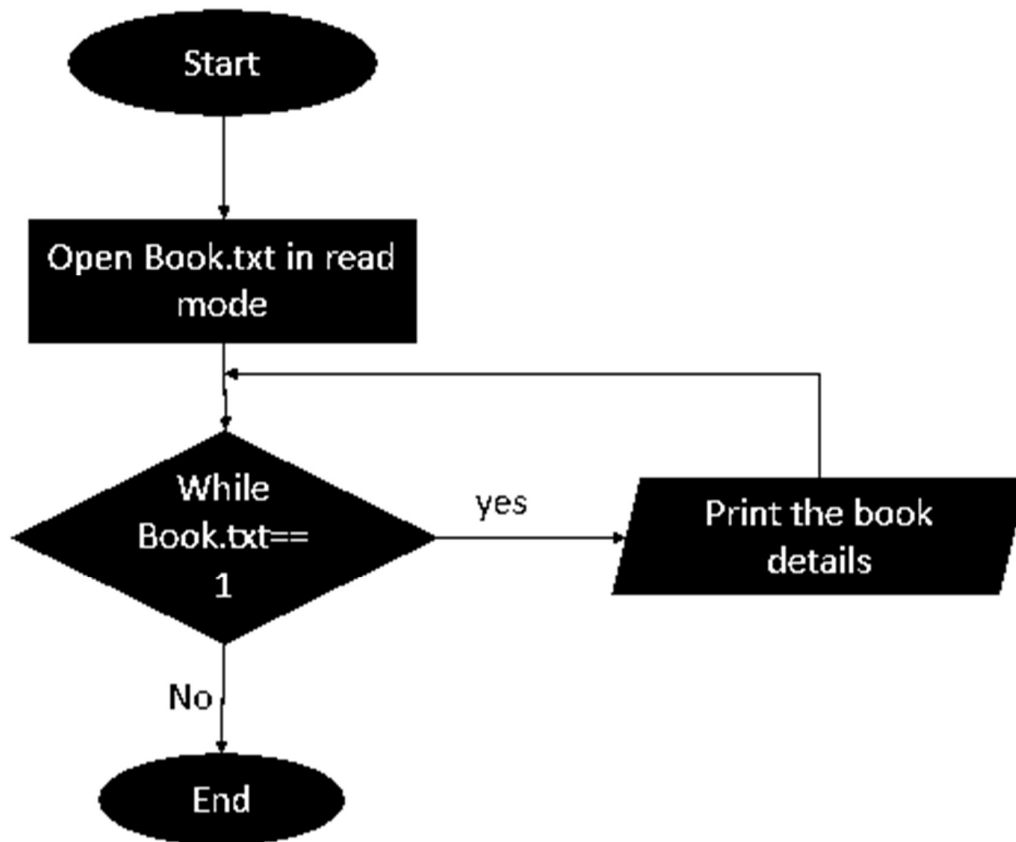


## ADD BOOK FUNCTION PSUEDO - CODE

```
01)  START
02)  DECLARE char myDate[12]
03)  OPEN "books.txt" for append data
04)  DISPLAY "Enter book id: "
05)  READ book id from user and store in b.id
06)  DISPLAY "Enter book name: "
07)  READ book name from user and store in b.bookName
08)  DISPLAY "Enter author name: "
09)  READ author name from user and store in b.authorName
10)  DISPLAY "Book Added Successfully"
11)  WRITE record b to "books.txt"
12)  CLOSE "books.txt"
13)  END
```



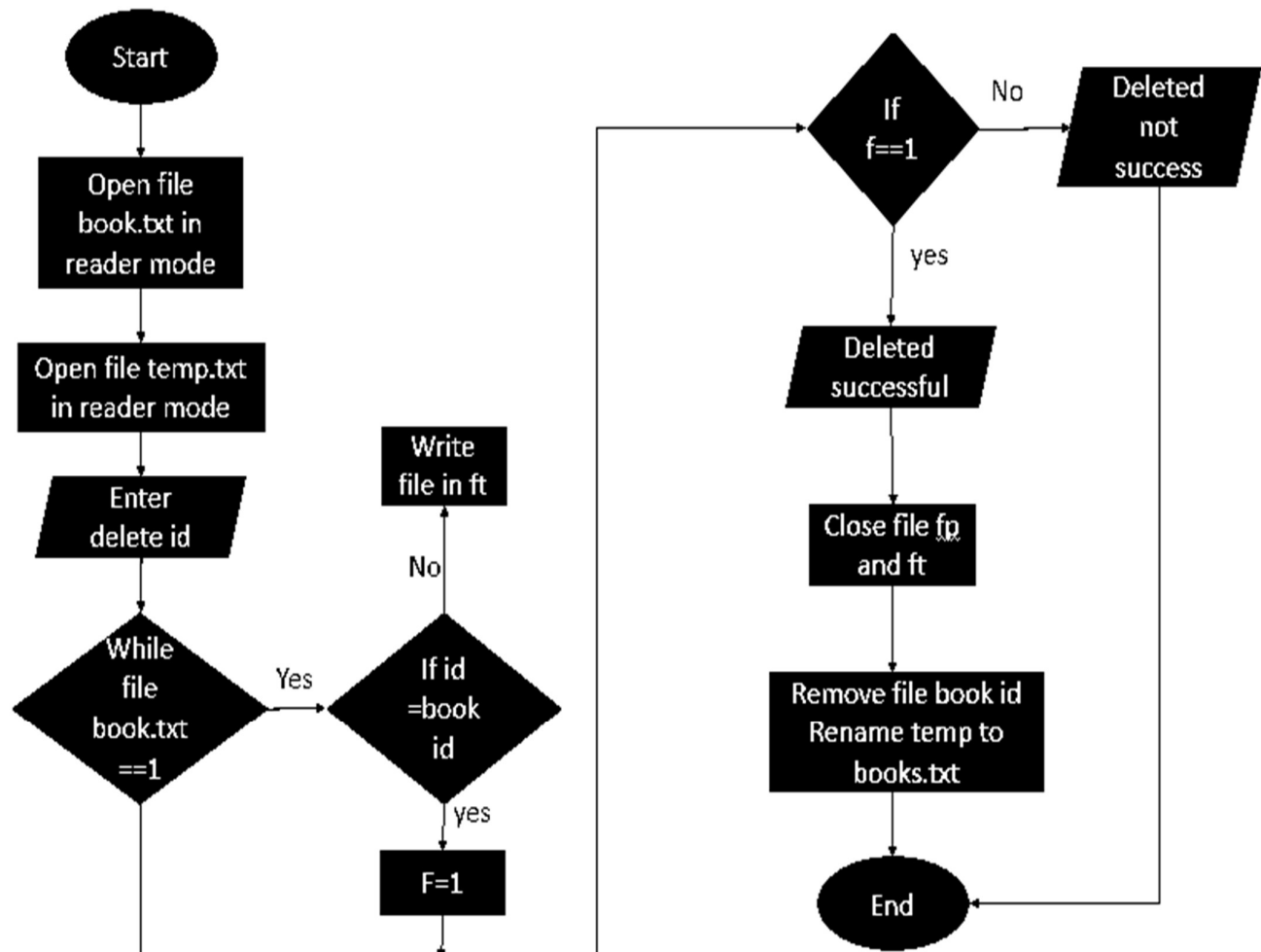
- BOOK LIST FUNCTION



### BOOK LIST FUNCTION PSUEDO - CODE

- 01) START
- 02) DISPLAY "Available Books "
- 03) DISPLAY "Book id Book Name Author Date"
- 04) OPEN "books.txt" for reading in binary mode
- 05) WHILE NOT end of file "books.txt" DO
- 06) READ a record from "books.txt" into b
- 07) PRINT formatted book details to console
- 08) END WHILE
- 09) CLOSE "books.txt"
- 10) END

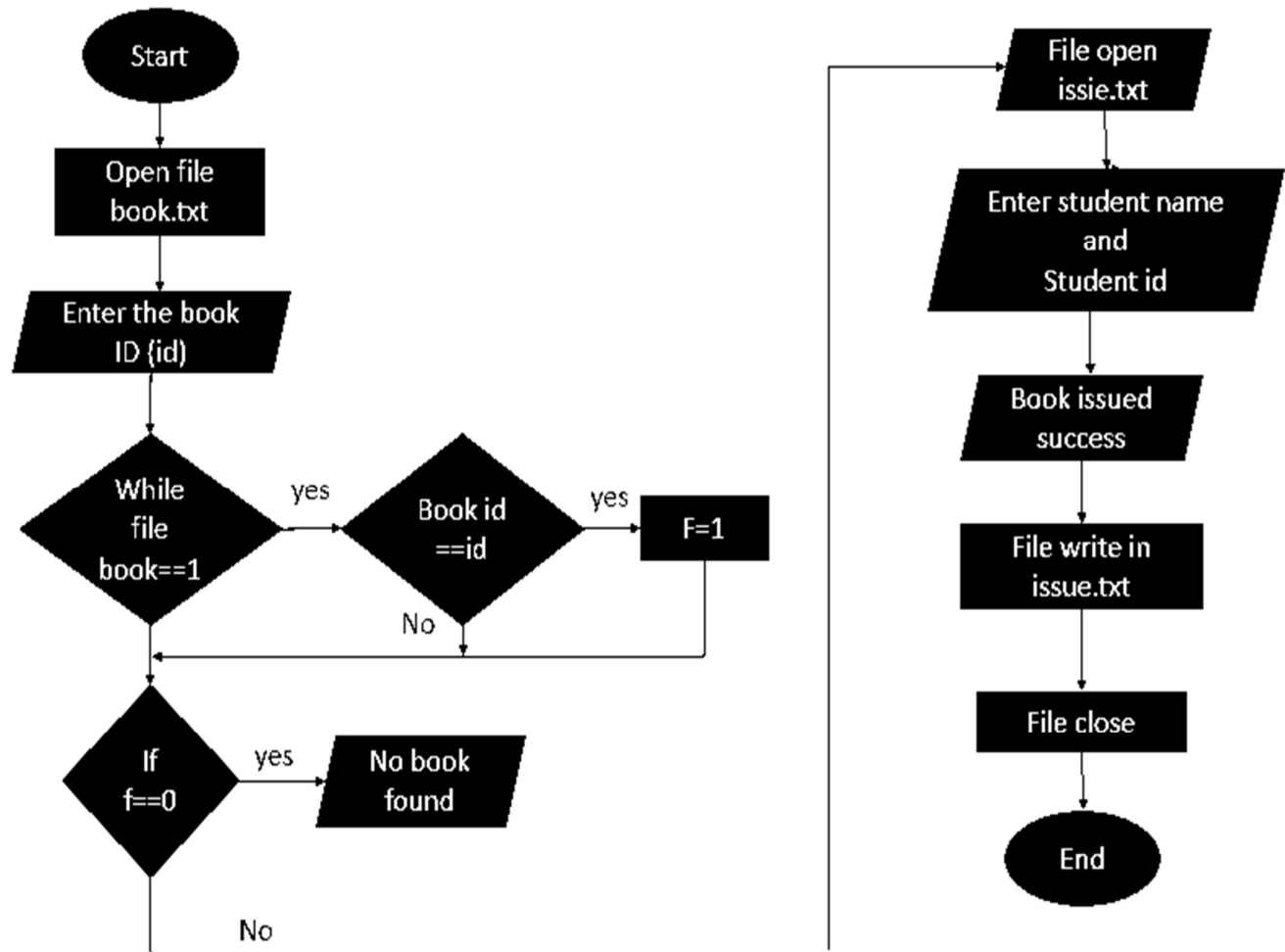
- DELETE FUNCTION



## DELETE FUNCTION PSUEDO - CODE

```
01)  START
02)  DISPLAY "Remove Books"
03)  READ Book ID from user
04)  OPEN "books.txt" for reading
05)  OPEN "temp.txt" for writing
06)  SET f = 0
07)  WHILE NOT end of file "books.txt" DO
08)  READ a record from "books.txt"
09)  IF ID equals user-provided ID THEN
10)  SET f == 1
11)  ELSE
12)  WRITE record to "temp.txt"
13)  END IF
14)  END WHILE
15)  IF flag f is 1 THEN
16)  DISPLAY "Deleted Successfully"
17)  ELSE
18)  DISPLAY "Record Not Found"
19)  END IF
20)  CLOSE "books.txt" and "temp.txt"
21)  REMOVE "books.txt"
22)  RENAME "temp.txt" to "books.txt"
23)  END
```

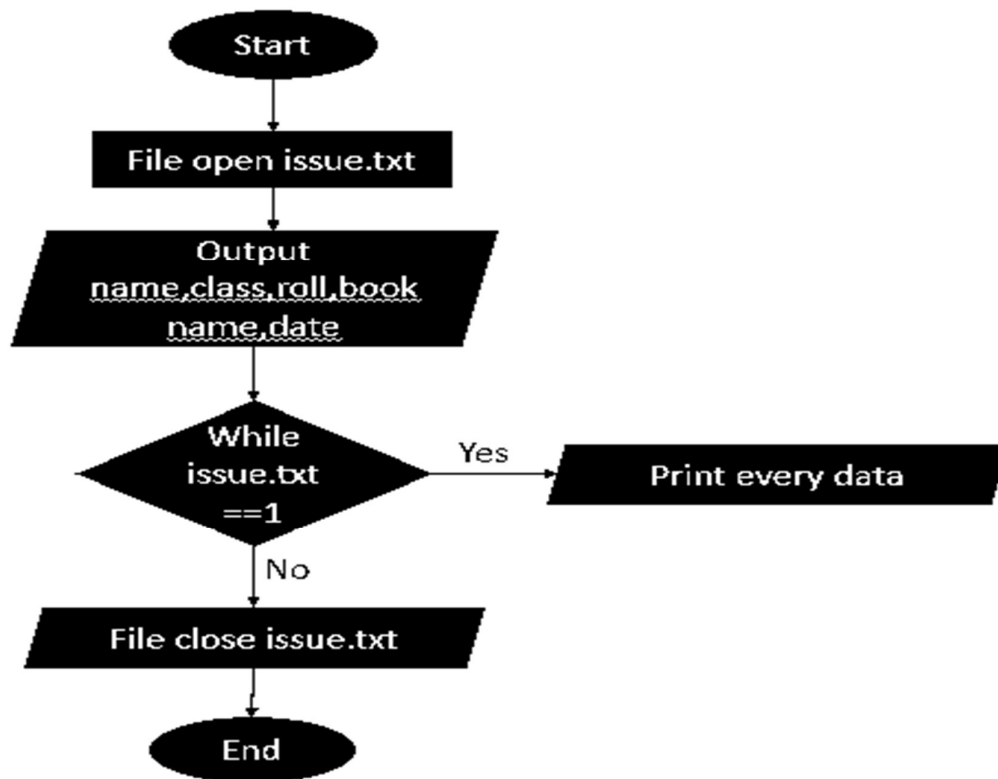
- ISSUE BOOK FUNCTION



## ISSUE BOOK FUNCTION PSUEDO - CODE

```
01)  START
02)  DECLARE char myDate[12]
03)  DECLARE integer variable f = 0
04)  DISPLAY "Issue Books"
05)  READ Book ID to issue from user and store in s.id
06)  OPEN "books.txt" for reading in binary mode
07)  WHILE NOT end of file "books.txt" DO
08)  READ a record from "books.txt" into b
09)  IF b.(id == s.id) THEN
10)  COPY b.bookName to s.bookName
11)  SET f = 1
12)  BREAK
13)  END IF
14)  END WHILE
15)  CLOSE "books.txt"
16)  IF (f == 0) THEN
17)  DISPLAY "No book found with this id"
18)  DISPLAY "Please try again"
19)  END IF
20)  OPEN "issue.txt" in append mode
21)  READ Student Name from user and store in s.sName
22)  READ Student Class from user and store in s.sClass
23)  READ Student Roll from user and store in s.sRoll
24)  DISPLAY "Book Issued Successfully"
25)  WRITE record s to "issue.txt"
26)  CLOSE "issue.txt"
27)  END
```

- ISSUE BOOK LIST FUNCTION



### ISSUE BOOK LIST FUNCTION PSUEDO - CODE

- 01) START
- 02) DISPLAY "Book Issue List"
- 03) DISPLAY :  
      "S.id", "Name", "Class", "Roll", "Book Name", "Date"
- 04) OPEN "issue.txt" for reading
- 05) WHILE NOT end of file "issue.txt" DO
- 06) READ a record from "issue.txt" into s
- 07) PRINT formatted record s to console
- 08) END WHILE
- 09) CLOSE "issue.txt"
- 10) END

## 06 . SOURCE-CODE

```
#include<stdio.h>
#include<stdlib.h>
#include<time.h>

void addBook();
void booksList();
void del();
void issueBook();
void issueList();

struct books{
    int id;
    char bookName[50];
    char authorName[50];
    char date[12];
}b;

struct student{
    int id;
    char sName[50];
    char sClass[50];
    int sRoll;
    char bookName[50];
    char date[12];
}s;
```

```
FILE *fp;

int main(){

    int ch;

    while(1){
        system("cls");
        system("color 0A");
        printf("\t\t\t=====\n");
        printf("\t\t\t<== Library Management System ==>\n");
        printf("\t\t\t=====\n");

        printf("1.Add Book\n");
        printf("2.Books List\n");
        printf("3.Remove Book\n");
        printf("4.Issue Book\n");
        printf("5.Issued Book List\n");
        printf("0.Exit\n\n");
        printf("Enter your choice : ");
        scanf("%d", &ch);

        switch(ch){
            case 0:
                exit(0);

            case 1:
                addBook();
                break;
```



```
        case 2:
            booksList();
            break;

        case 3:
            del();
            break;

        case 4:
            issueBook();
            break;

        case 5:
            issueList();
            break;

        default:
            printf("Invalid Choice...\n\n");

    }
    printf("\nPress Any Key To Homepage...");
    getch();
}

return 0;
}
```

```

void addBook(){
    char myDate[12];
    time_t t = time(NULL);
    struct tm tm = *localtime(&t);
    sprintf(myDate, "%02d/%02d/%d", tm.tm_mday, tm.tm_mon + 1, tm.tm_year + 1900);
    strcpy(b.date, myDate);

    fp = fopen("books.txt", "ab");

    printf("Enter book id      : ");
    scanf("%d", &b.id);
    printf("Enter book name    : ");
    fflush(stdin); //to avoid garbage value
    gets(b.bookName);

    printf("Enter author name : ");
    fflush(stdin); //to avoid garbage value
    gets(b.authorName);

    printf("Book Added Successfully");

    fwrite(&b, sizeof(b), 1, fp);
    fclose(fp);
}

void booksList(){

    system("cls");
    printf("\t\t\t<== Available Books ==>\n\n");
    printf("%-10s %-30s %-20s %s\n\n", "Book id", "Book Name", "Author", "Date");

    fp = fopen("books.txt", "rb");
    while(fread(&b, sizeof(b), 1, fp) == 1){
        printf("%-10d %-30s %-20s %s\n", b.id, b.bookName, b.authorName, b.date);
    }

    fclose(fp);
}

```

```
void del(){
    int id, f=0;
    system("cls");
    printf("\t\t<== Remove Books ==>\n\n");
    printf("Enter Book id to remove : ");
    scanf("%d", &id);

    FILE *ft;

    fp = fopen("books.txt", "rb");
    ft = fopen("temp.txt", "wb");

    while(fread(&b, sizeof(b), 1, fp) == 1){
        if(id == b.id){
            f=1;
        }else{
            fwrite(&b, sizeof(b), 1, ft);
        }
    }

    if(f==1)
    {
        printf("\n\nDeleted Successfully.");
    }
    else
    {
        printf("\n\nRecord Not Found !");
    }

    fclose(fp);
    fclose(ft);

    remove("books.txt");
    rename("temp.txt", "books.txt");
}
```

```
void issueBook(){

    char myDate[12];
    time_t t = time(NULL);
    struct tm tm = *localtime(&t);
    sprintf(myDate, "%02d/%02d/%d", tm.tm_mday, tm.tm_mon+1, tm.tm_year + 1900);
    strcpy(s.date, myDate);

    int f=0;

    system("cls");
    printf("\t\t<== Issue Books ==>\n\n");

    printf("Enter Book id to issue : ");
    scanf("%d", &s.id);

    //Check if we have any book of given id
    fp = fopen("books.txt", "rb");

    while(fread(&b, sizeof(b), 1, fp) == 1){
        if(b.id == s.id){
            strcpy(s.bookName, b.bookName);
            f=1;
            break;
        }
    }

    if(f==0){
        printf("No book found with this id\n");
        printf("Please try again...\n\n");
        return;
    }

    fp = fopen("issue.txt", "ab");

    printf("Enter Student Name : ");
    fflush(stdin);
    gets(s.sName);

    printf("Enter Student Class : ");
    fflush(stdin);
    gets(s.sClass);

    printf("Enter Student Roll no: ");
    scanf("%d", &s.sRoll);

    printf("Book Issued Successfully\n\n");

    fwrite(&s, sizeof(s), 1, fp);
    fclose(fp);
}
```

```
void issueList(){
    system("cls");
    printf("\t\t\t\t<== Book Issue List ==>\n\n");

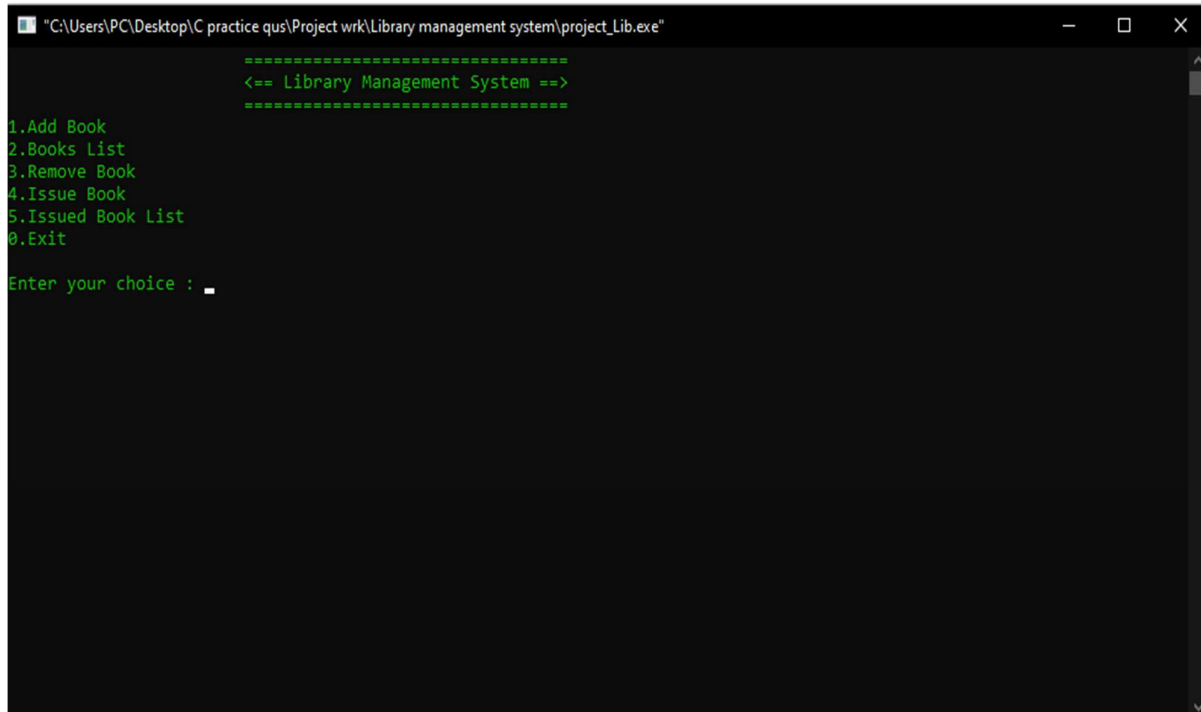
    printf("%-10s %-30s %-20s %-10s %-30s %s\n\n", "B.id", "Name", "Class", "Roll", "Book Name", "Date");

    fp = fopen("issue.txt", "rb");
    while(fread(&s, sizeof(s), 1, fp) == 1){
        printf("%-10d %-30s %-20s %-10d %-30s %s\n", s.id, s.sName, s.sClass, s.sRoll, s.bookName, s.date);
    }

    fclose(fp);
}
```

## 07. OUTPUT

- Main Menu



```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Library Management System ==>

1.Add Book
2.Books List
3.Remove Book
4.Issue Book
5.Issued Book List
0.Exit

Enter your choice : _
```

- Add Book Function

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

=====
<== Library Management System ==>
=====

1.Add Book
2.Books List
3.Remove Book
4.Issue Book
5.Issued Book List
0.Exit

Enter your choice : 1
Enter book id      : 4
Enter book name    : The Hobbit
Enter author name  : J.R.R.Tolkein
Book Added Successfully
Press Any Key To Homepage...
```

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

=====
<== Library Management System ==>
=====

1.Add Book
2.Books List
3.Remove Book
4.Issue Book
5.Issued Book List
0.Exit

Enter your choice : 1
Enter book id      : 5
Enter book name    : The Knowledge Gap
Enter author name  : Natalie
Book Added Successfully
Press Any Key To Homepage...
```

- We are going to add two Books to the library system. The book names are “**The Hobbit**” and “**The Knowledge Gap**”.
- The authors are **Mr.J.R.R.Tolkein** and **Mrs.Natalie**.

- Book List Function

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Available Books ==>

Book id    Book Name                Author                Date
1          Democracy & Education    Dewey, John           02/02/2024
2          Pedagogy of the Oppressed  Freire, Paulo         02/02/2024
3          Frames of Mind            Gardner, Howard       02/02/2024
5          The Knowledge Gap         Natalie               04/02/2024
4          The Hobbit                J.R.R.Tolkein        04/02/2024

Press Any Key To Homepage...
```

- You can see the list of books ,Their Authors and the date that books have been stored that in the Library

- Delete Book Function

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Remove Books ==>

Enter Book id to remove : 5

Deleted Successfully.
Press Any Key To Homepage...
```

- Here you can see that We are going to delete a book from our storage. so we are giving the book Id to remove.
- There is a book available in book if 5. So the “**Deleted successfully**” message is displayed.
- After deleting the book In the book List You can see that Book ID 5 Book name =”**The Knowledge Gap**” is removed.

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Available Books ==>

Book id    Book Name                Author                Date
1          Democracy & Education    Dewey, John           02/02/2024
2          Pedagogy of the Oppressed  Freire, Paulo         02/02/2024
3          Frames of Mind            Gardner, Howard       02/02/2024
4          The Hobbit                J.R.R.Tolkein        04/02/2024

Press Any Key To Homepage...
```

- If we enter a wrong book id “**Record Not Found**” message will be displayed. You can see it below.

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Remove Books ==>

Enter Book id to remove : 9

Record Not Found !
Press Any Key To Homepage...
```

- Issue Book Function

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Issue Books ==>

Enter Book id to issue : 4
Enter Student Name : Abbi
Enter Student Class : 10
Enter Student Roll no: 100
Book Issued Successfully

Press Any Key To Homepage...
```

```
"C:\Users\PC\Desktop\C practice qus\Project wrk\Library management system\project_Lib.exe"

<== Issue Books ==>

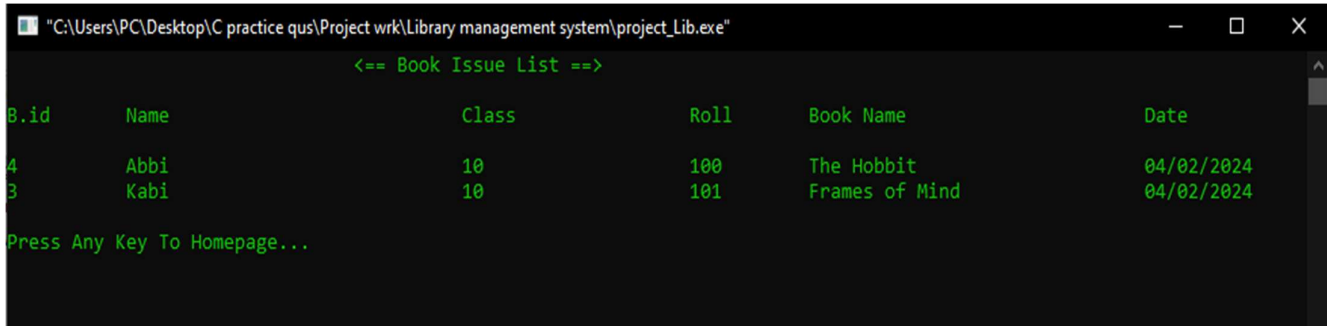
Enter Book id to issue : 3
Enter Student Name : Kabi
Enter Student Class : 10
Enter Student Roll no: 101
Book Issued Successfully

Press Any Key To Homepage...
```

- We are going to issue books to two school students their name called Abbi and Kabi.



- Issue Book List



B.id	Name	Class	Roll	Book Name	Date
4	Abbi	10	100	The Hobbit	04/02/2024
3	Kabi	10	101	Frames of Mind	04/02/2024

Press Any Key To Homepage...

- The list of books and the name of students who borrow that will be shown in the issue book list function.

## 08. CONCLUSION

In conclusion, the implementation of a library management system represents a transformative leap for our school library. It marks a shift from traditional, paper-based methods to a digitized, streamlined approach that enhances every aspect of library operations. This system is far more than just a software solution; it is a catalyst for progress, innovation and increased accessibility.

## 09. REFERENCES

- 1) <https://github.com/>
- 2) <https://stackoverflow.com/>
- 3) <https://youtube.com/>

## **10. RISK MANAGEMENT**

### **➤ Large number of users than planned**

The number of users that will be estimated can be less but as the product gets more fame, number of users increases. Server breaks down Due to the breakdown of server, our customers will not be able to connect to our website.

### **➤ Data loss**

Sometimes, the computer may get crash due to which all our data will be lost and this is a major issue.

### **➤ Users resist system**

It is quite difficult to convince people to opt for digitalized book management system because there are many people who prefer physical voting. It takes a small period of time to adapt for this change and this is one of best solution in this pandemic as all the user are safe and protected at their houses while the voting process is done without any inconvenience.

## **11. FUTURE ENHANCEMENT**

We are planning to develop the user interface for this system to be more user friendly and we are going to work on solutions for the risks we found in the risk management process. We are planning to extend this system to use for some other managing purposes as designing it further to suit to all kind of library which will be our highest target of this project.

## 12. INDIVIDUAL CONTRIBUTION

Name & Entrollment_No	Contribution
<b>M.A.M.AHSAN</b> <b>(UWU_CST_22_001)</b>	1) Making Presentation 2) Coding for the add Book function part 3) Flow chart and Pseudo code for add Book function
<b>T.ABBISHANTH</b> <b>(UWU_CST_22_059)</b>	1 ) Making Presentation 2 ) Coding for the Issue Book function part 3 ) Flow chart and Pseudo code for Issue Book function
<b>J.ARULTHARISAN</b> <b>(UWU_CST_22_076)</b>	1 ) Making Report 2 ) Coding for the main function part 3 ) Flow chart and Pseudo code for main function
<b>K.ABISAJAN</b> <b>(UWU_CST_22_077)</b>	1 ) Making Report 2 ) Coding for the Book list function and Issue book list part 3 ) Flow chart and Pseudo code for Book list function and Issue book list part
<b>M.M.ISTHIKAN</b> <b>(UWU_CST_22_107)</b>	1) Making Presentation 2) Coding for the Delete Book function part 3) Flow chart and Pseudo code for Delete Book function