



# **Introduction**

## **Objectives and Goals**

This report presents the Library Management System (LMS) that has been implemented as part of our third year project. The LMS enables the user to interact with the library in an easy way, to improve the services of the library and information access.

Implementation of library management system means that the users can search, borrow, return, add and delete much kind of books and subjects from and for the library, There is a note that adding and removing books the Librarian is only allowed to use these two operations, we can also consider borrowing with the previous two operations to avoid borrowing books by using other users Id, so implementing include user name and password. The goals of our software establish a fully indexed computer database of the library materials in the collection by selecting appropriate library software.

## **Overview of the report**

This report aims to provide a description of the system that manage library, it will contains the method, techniques and tools used to implementing this software.

The first chapter discuss the problem which is implement software to manage the library, and then it will discuss operations which is search, borrow return, add and delete and what the input and the output for each operation. The second chapter wills that it will talk about the design, which discuss each operation, but in detail by using block diagrams and flowchart. The third chapter describes the implementation, which means what the function we used in each operation by using the C++ languages. Fourth chapter is advantages and limitation, which will describe the advantages and disadvantages for each operation. This report will include also some codes and, it shows the future evolution in the conclusion and recommendation section.



## **Chapter1**

### **Problem and analysis**

#### **1.1 problem**

Dealing with the operations in the library is not an easy work . because the library has many different resources like books , magazines, newspaper and video cassettes, so if we imagine that the user will search for a book in the library , he may take several hours and also the same problem will happened with the rest resources . i.e. if the user would like to search for a book he has to go first for books list to check if the book is there or not, then he has to go to the borrowing note to check if the book is borrowed or not .after that he can know the case of the book if it available or not through all registrations note.

Actually we called the previous method of searching is a manual method which mean that the user will take a time to retrieve what he want from the library . and that will not encourage people to deal with libraries and also the number of readers and visitors to the library will decrease .

For the above problem , the library should be managed by the system which called “Library management system” which is the program he can avoid the problems on dealing with the operations of the library . So the user can search or borrow in an easy way .By this it mean that when the user would like to search he can access to the system and choose the operation that he would like to do it like searching , borrowing and returning . All these operations can be done in few second because all books are saved to the file in the database. Also there is an identify number which is a unique number that every book is different from another . So program will search in the file and return the case to the user. For example, if the user searches a bout a book which is in the library , the program will go to the file and extract that book and show it to the user on the screen . Also for each book there is an identifying number which the user can go directly to the shelve which contain this number then he can find his book . And that actually will not take time , also if the book is not in the library and the user would like to check if its their or not . So he can go directly to the system and type his search , the program will search in the file which contain the details of each book . Then if the book is not found the



message will display to the user to inform him that the book he needs is not available in the library . By this way the user will save his effort for looking to that book which is not in the library rather than go to all shelves in the library and search for it one by one . So a dynamic method will achieve a big change in the library . In addition the dynamic method is very safety rather than manually because in case of register every thing in papers , it might destroyed or lost while in case of dynamic the information are safe because of saving inside memory. For the dynamic method the people will be attractive to dealing with the library . So it has to said that the program which runs the library through a computer is very important in our life because now a day every thing move with speed of work.

## **1.2 Requirements and specification**

The main aim for this project is to implement and design software that include three main operations searching for books, borrowing and returning books any references from the library, and to implement interface that show these three operations, finally to make database which include two files the first one to store books information, and the second file is to store users or customers information. Also it is require submitting three reports. The first report is the initial report and should be submitted after one month from the start. The second report is the progress report and should be submitted after the second month. Finally the last report is the final report and should be submitted with the final product.

Our software will be divided into five operations, which are searching for books, borrowing, returning, adding and deleting books from or for the library.

In the interface each operation has window, first window will show the five main operations. If the user chooses the first search operation he will see four choices to search either by author, title, and subject or by using cross method which mean search by author, title and subject together. The second operation is borrow, the borrow will the user message to enter the Id of the user then it will ask the user to enter the book Id, if the Id of the book is wrong the system will send to the user message. The third operation is return and it's like the borrow operation the system will ask the user to enter his Id and the books Id. The fourth operation is add a book, here the system will ask the user to



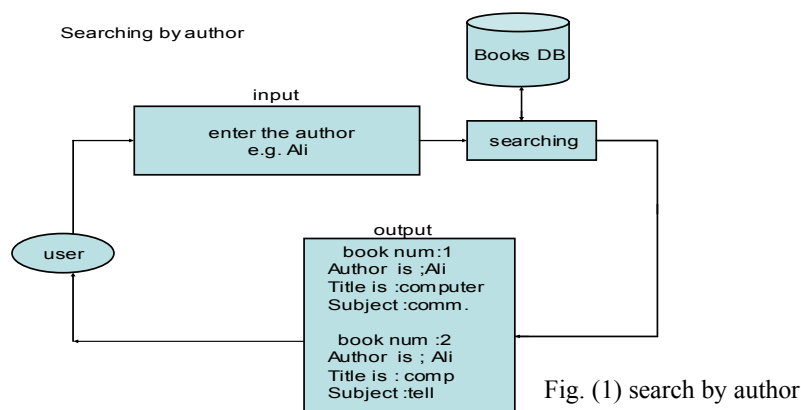
enter information about the book such as the title, ISBN, the author, the Id number of the book, the subject, the publisher and the status. The last operation is delete book where the system asks the user to enter the Id of the book.

### 1.3 Analysis

The project contain of three operations that the user can use them depend on what the user need from the program to do. The operations are searching, borrowing and retuning the book to the library.

#### 1.3.1 Searching process

If the user would like to make a search in the library there is three methods to do a search which are (author, title, subject and cross method) .And for each type of searching the output will be the list of books that the program will match it from the database depend on the type of the search that the user applied . If the user chooses searching by author, the program will ask the user to enter the name of the author as an input. And then the software will go to the file which contains the information of the books and move through each book . finally program will collect all books that have the same author.



Figure(1) shows an example of searching by author .So when the program asks the user to enter the author's name which in the above figure is "Ali". So the program go to the file in the database and extracts all books related to "Ali", and skips the remaining books



In case of searching by title, the program will take the title from the user as an input, then the program will connect to the file and extract the book which has the same title that entered by the user and display it on the screen as an output with its details. Otherwise when the title of the book is not found the message will be displayed to the user to inform him that the title is not matched.

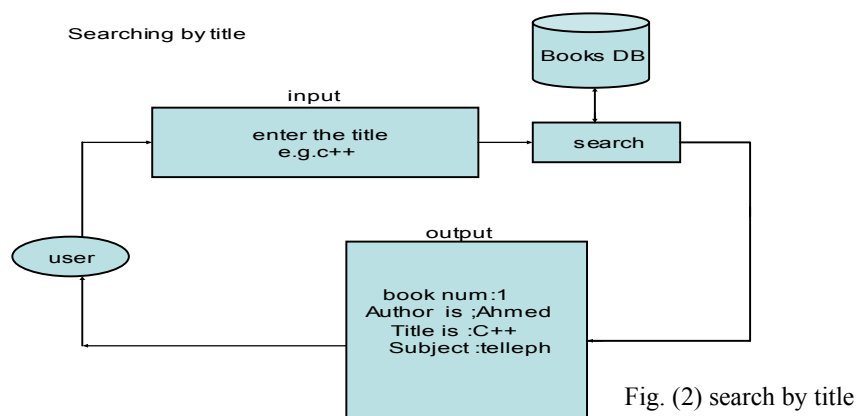


Figure (2) shows how search by title is done, as we can see the program will take the name of title that entered by the user which is in this case “C++”. Then the program will search on the file and collect all title relate start with C++, and in the above example there is only one book that match the title entered by the user.

In case of searching by subject the program will take the subject entered by the user as input, then the software will go to the file and retrieves all books relates to the subject that has been entered by the user.

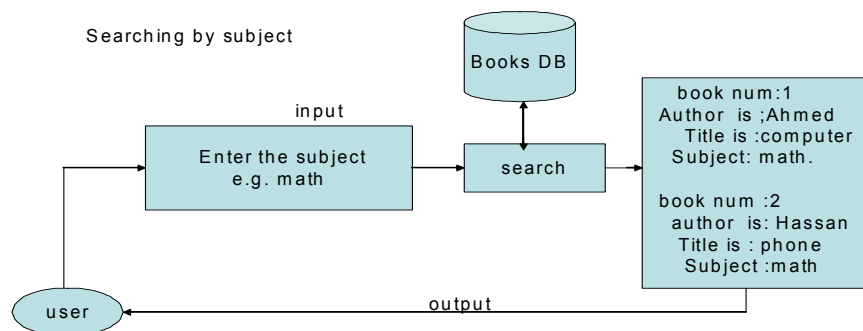


Fig. (3) search by subject

For searching by subject, the program will take the subject from the user and searches for it in the file, which in this case “math”. So there are two subjects in the file with the



same name. then the program will return two books with their details as in the output above.

In case of searching by the forth method which is by cross method . the software will ask the user to enters author , title and the subject . Then the program will take these information as an input . After that program will go to the book file and collect those books which have an information relate to what is entered by the user . But in this case the list of books will be focused on three attributes of each book that have all parts entered by the user , so the number of books will minimize .

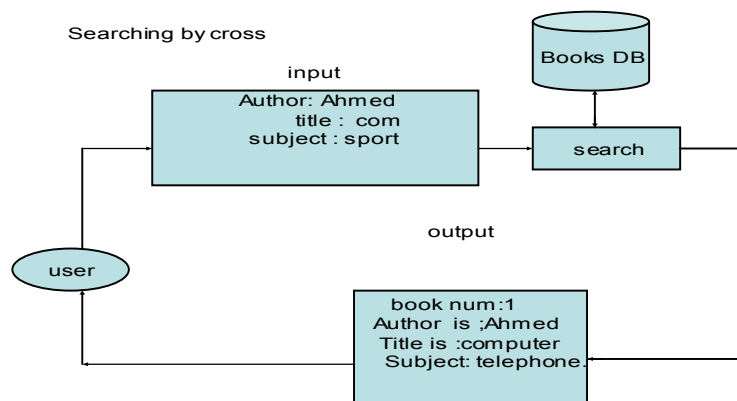


Fig. (4) search by cross me For

Figure (4) shows the cross method process. If the user types the author which in this case “Ahmed” and title “com” and the subject “sport”. The program will take these information and compared it with all books in the file . Then the comparison will be for each book in author which is the first token in the file ,title which is the second token and subject which is the third token in the file. And all this will occurs at the same time. In this case the program will collect all books start with “Ahmed” , and the title of the book start with “com” and in the same book if the subject is start with “sport “. then the program will print out all books that match the information entered by the user to the output.



### 1.3.2 Borrowing process

After a user do the searching operation . The next operation is borrow a book from the library . After the user choose borrowing operation , the program will ask the user about his ID number and the ID of the book . Then the program will go to the file called borrowing file which contains all books that are borrowed from the library . And check if book is there or not .In case of the book in the list of borrowing file the message will display to the user tell him the this book is borrowed by some one. Otherwise the borrowing process will register the book and student IDs in the borrowing file. Finally the message will display to the user show him that the operation is done successfully.

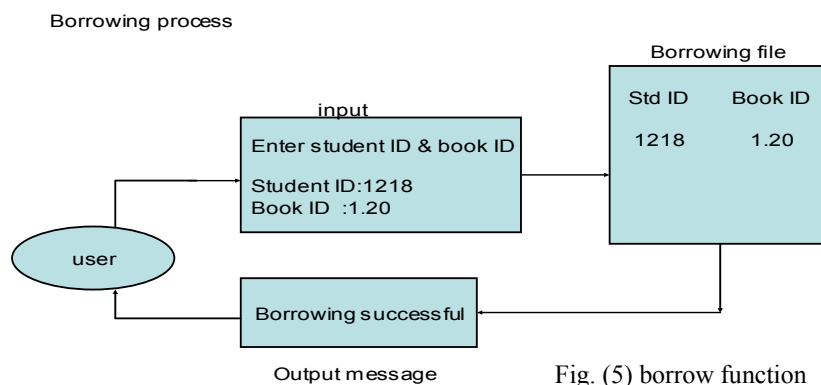


Fig. (5) borrow function

Figure (5) shows the procedure of borrowing a book . In this case the student would like to borrow a book from the library , the software will ask him to enter his ID and the book ID . Then the program will register this book with the student ID in the file called borrowing file.

### 1.3.3 Returning process

When the deadline of the book is coming and the user would like to return the book, first the program will ask the user to enter his ID and books ID. Then if the information



entered by the user is in the list, the program will delete them from the list and send a message to the user to tell him that the book is returned to the library .

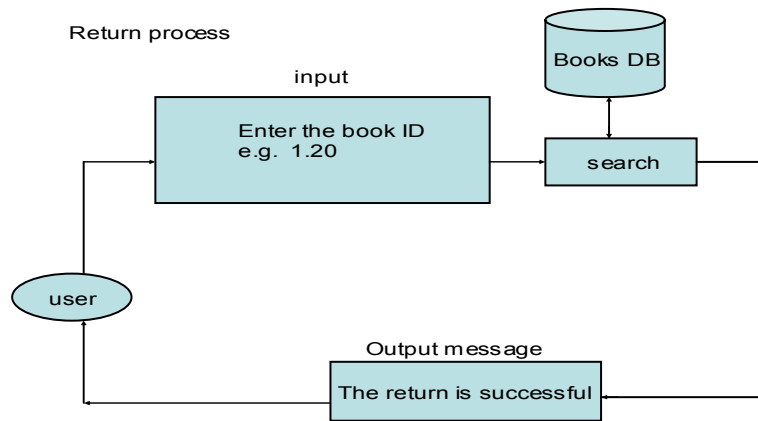


Fig. (6) return function

Figure (6) above shows how the book can be return to the library , the only required for this operation is the book ID then the program will connect to borrowed file in the database and delete that book from the borrowing file , so the book will be returned to the library.

### 1.3.4 Adding books

When new books arrive to the library and when the librarian would like to add the books to the books file in the database. So the procedure is taking the details of the book and registers the book in the database.

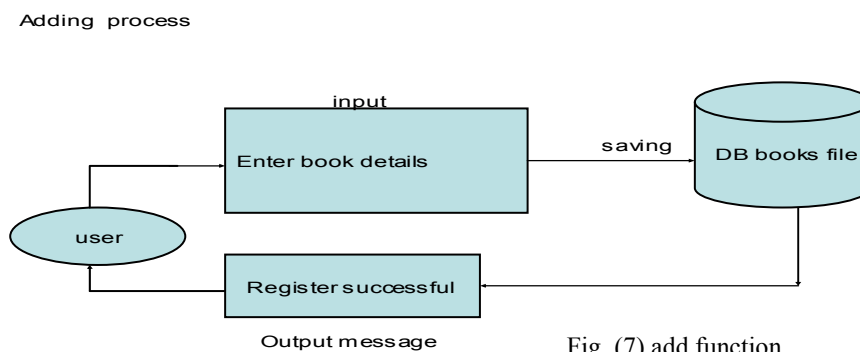


Fig. (7) add function





Figure (7) in the previous page shows the add function. The user will enter the details of the book which are ( author , title , subject, publisher , ISBN , Book ID and Status of the book ) as an input . then the software will take this information and stores them in the books file in the database followed by a message which will describe the operation .

### 1.3.5 Delete process:

For deleting a book from the library the user will be asked to enter only the book ID as an input . Actually it is easy to deal with the book ID because each book has different ID from another ,then the software will check in the file until matching the correct ID to be deleted .

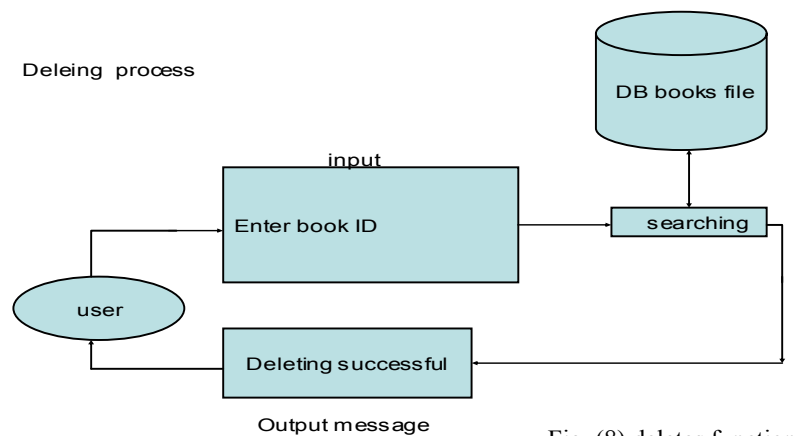


Fig. (8) deletes function

The example above shown in figure (8) shows the process of deleting a book from the library. In this case the software will ask the user to enter the book ID as an input. Then by searching in the books file for this ID book, the message will be displayed to the user to show whether the book has been deleted or not.



## **Chapter 2**

### **System Design**

Library management system software consists of three main parts. the first one is a user who will interact with the second part which is an interface. The interface contains all operations that can serve the user to deal with the library. Finally where the user choose an operation from the interface. The information will be taken from the database. the database contain these files (books file, borrowing file, students file).

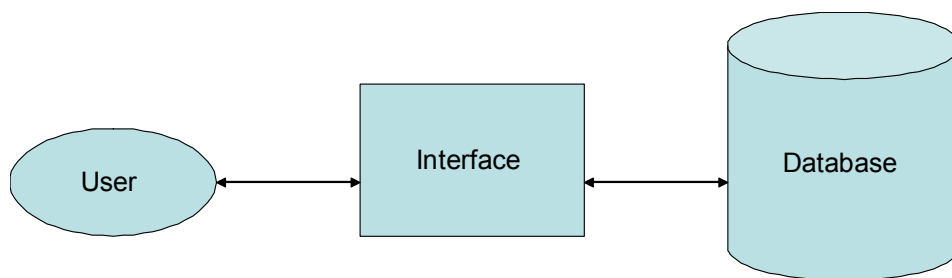


Fig. (9) system block diagram

The figure (9) above shows how the user interacts with the interface to get the information from the database. So the information will be displayed to the user through the interface.

There are five operations in the interface that the user can used , which described in details in the following sections.

### **2.1 Design operations**

#### **2.1.1 Design search operation**

The searching process is a process which allows the user to search for books in the library by different ways. And actually a search process consists of four types which are searching by author (1) , searching by title (2), searching by subject(3) or searching by cross method (4)). The flow chart shown in figure (10 ) below shows the search operation.

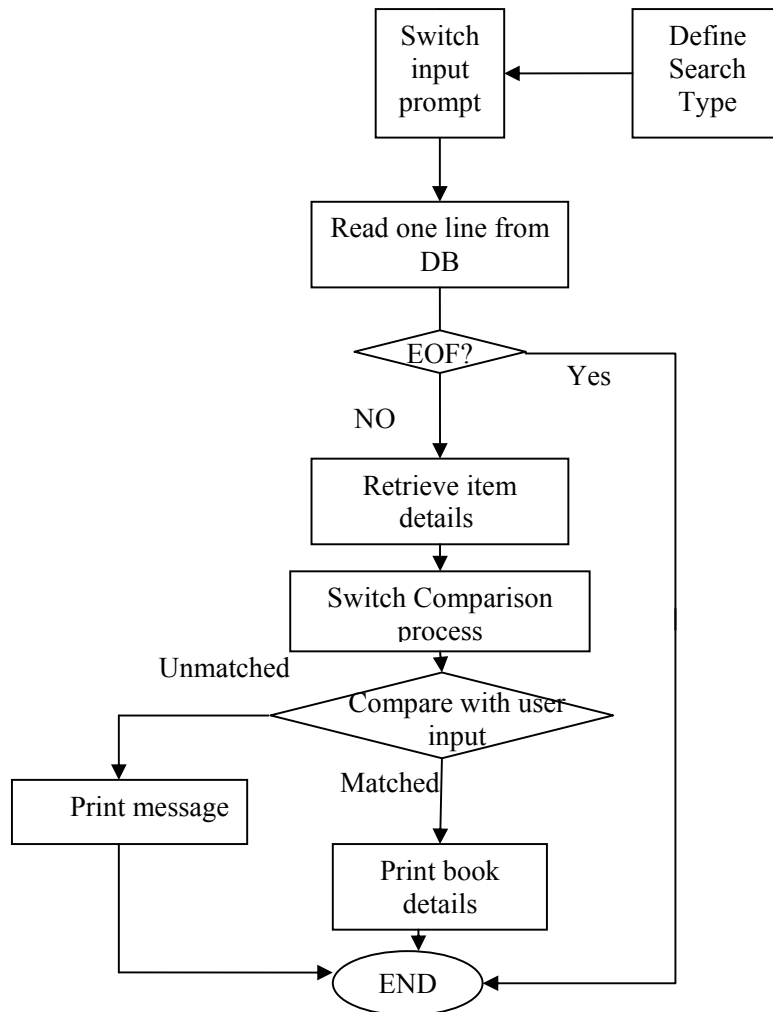


Fig. (10 ) Search operation

The previous flow chart shows the search operation used in the library management software. The software first gives the user four choices for search as mentioned before. After the user choose the type of search then the software will ask the user to enter the information according to his choice . Then it will go to the books file, which contains all details about the data in the books file. If the data entered by the user matches any data from the books file then the software will print out details about the matched books. On the other hand if no books match the data entered by the user then the software will print out a message to the user telling him that the book you search for is not available in the library. Now each case of searching will be explained.



In the case of searching by author, the software will ask the user to enter the name of the author that he needs. Then the software will go to the books file in the database which contain all the books and collect all the books that contain the name of the author. Finally the software will display all these books with there corresponding details. So the user can choose his required book from the list of books that are displayed on the screen. In addition to searching by author the user can enter the author's name . Then the software will collect all books according to what is entered by the user and display the books that collected by the software. In the case of searching by title, the software will ask the user to enter the title of the book as an input that he need to look for in the library. Then the software will go and extract all books with the same title (actually all copies of the same book) will be displayed on the screen as an output . In the case of searching by subject, the software will ask the user to enter the subject as an input. So the software will look for different books with the same subject, and then the software will collect the books with the same subject from the books file and display them to the user with details as an output . So the user can decide which book that he is looking for from the list on the screen. In the case of searching by a cross method which is mixed of the previous three types. This type of searching exists when the user knows the subject but he does not know the whole name of the author and title of the book, so the software will go to the books file and extract a specific book related to the details (author, title, and subject) entered by the user and display the result on the screen. In addition even if the user enters a part for each attribute (author , title and the subject) the software will focus on the parts of attributes , and returns the results on the screen as an output. Also as an option the user can insert part of the characters , and according to the character entered by the user the software will display books start with partial matter.

### **2.1.2 Borrow operation**

After searching for book, if a student wants to borrow the book he must go to the borrow operation. The flow chart shown in figure (11) shows the borrow operation.

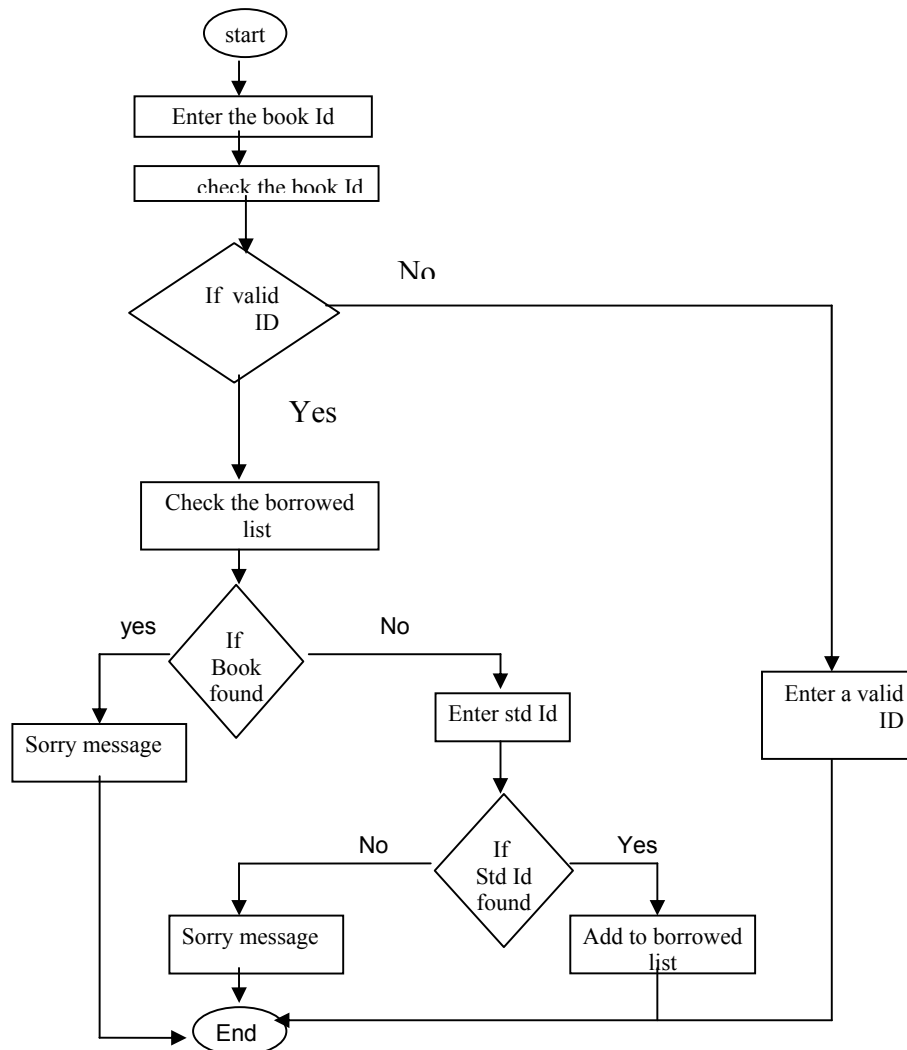


fig. ( 11) borrow operation

The above flow chart shows the borrow operation. In this operation, first of all, the software will ask the user to enter the book Id as an input for this operation, then the software tests if the book Id entered by the user is valid ID or not. If it is not a valid number, the software will print out a message for the user that the book id must be a number. But if the book Id is a number then the software will go and check the borrowed books file which contains a list of all borrowed books from the library. And if this book Id is found in the borrowed file the software will send a message telling the user that this book was borrowed and is not available at present time. On the other hand if the book Id is not found in the borrowed file then the software will ask the user to enter the student Id



as a second input for this operation . The software will also check if this student Id is found in student file which contains all students Id. And if the software find this Id in the student file it will go to the borrowed books file and add a new line containing the book Id and student Id. But if the student Id is not found in the student file then the software will send a message that this student Id is wrong and the software will ask the user to try again.

### 2.1.3 Return operation

The return operation is used when a student wants to return a book to the library after he has borrowed it. The flow chart below shows all the steps of the return operation in the library management software.

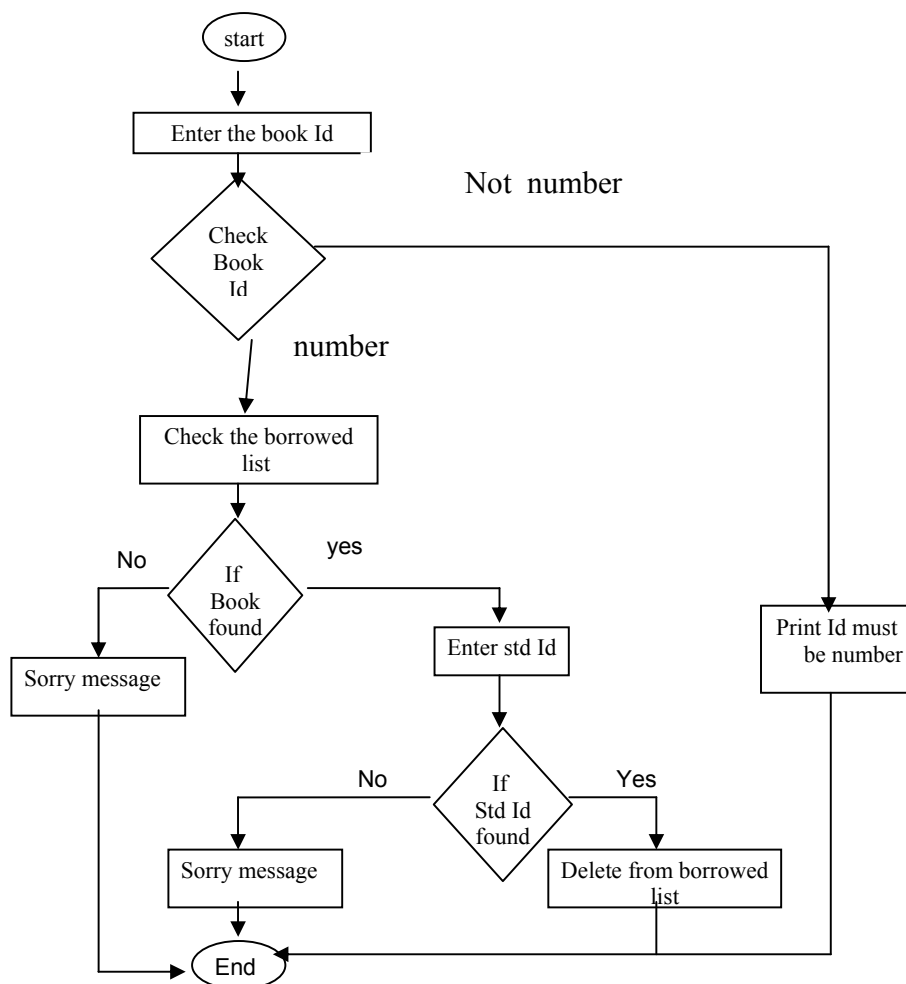


Fig. (12 ) return operation



The same as the borrow operation. In the return operation the software will ask the user first for the book Id then it will check if this Id is a number or not. And if it is not a number then the software will send a message for the user telling him that the book Id must be a number, on the other hand if this Id is a number then the software will search for this book Id in the borrowed books file which contains all the borrowed books from the library. If the book Id is not found in this file the software will send a message that either this book is not in the borrowed list or you have entered a wrong book Id and to try again. But if the software find this Id it will ask the user to enter the student Id then it will also check this student Id and compare it with Id of student who has borrowed this book and if it is the correct Id then the software will go to the borrowed books file and delete the student Id and book Id. But if student input a wrong ID, then the software will send a message that this student Id is wrong.

#### 2.1.4 Add book

If the user would like to add a book to the library he can follow the following chart

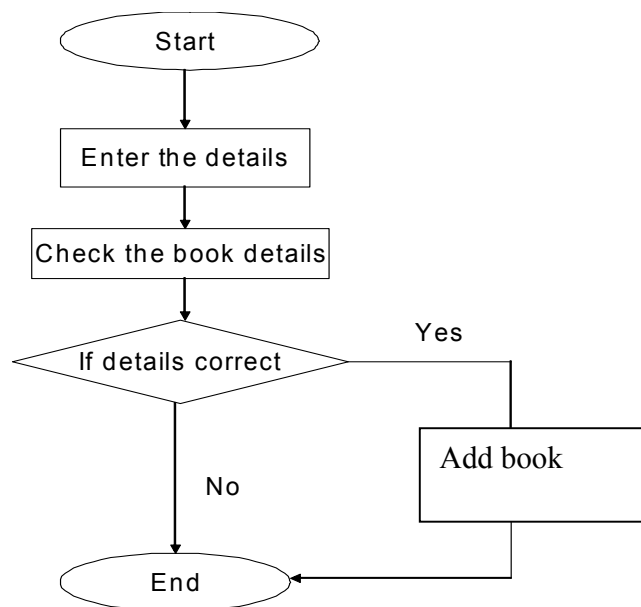


Fig. (13) add operation



The figure (13) shows how the user can add book to the library. First the software will ask the user to enter the details of the books which are (author, title, subject, publisher, ISBN, book ID and the status of the books). Then the software will take this information and save it in the books file.

### 2.1.5 Delete books

When the librarian would like to delete a book from the library he follows the following chart.

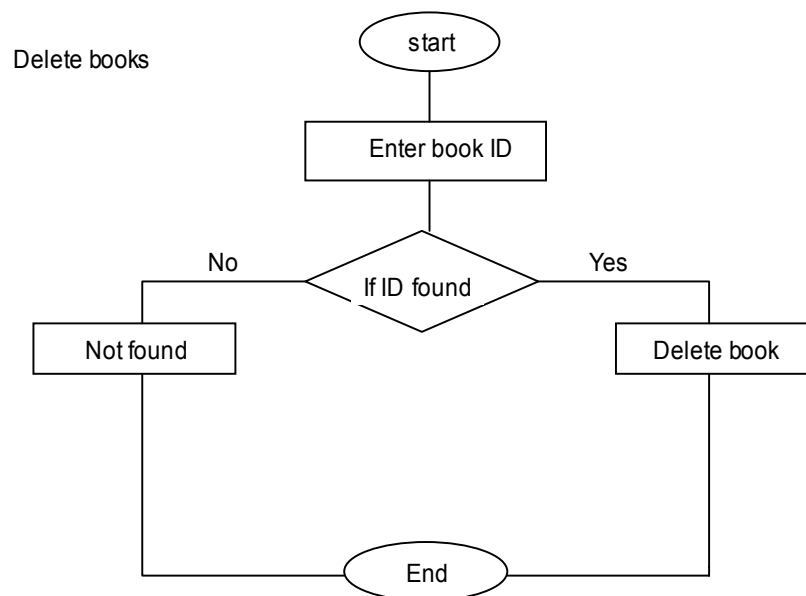


Fig.(14) delete operation

For deleting a book as we can see above is that the user will be asked first to enter the book ID as an input, then the software will check this ID if its in the list of the library, if its there the message will be display to the user to inform that the book has deleted.

On the other hand if it is not found in the library, the message will be shown to the user to tell him that the ID of the book that entered is wrong.





## 2.2 Database design

There are three files included in the database, the first file which is called (books2). This file contains the information of thirty books taken from college library. The information of each book is distributed in the file in sequence (author, title, subject, publisher, ISBN, item number and status of the book) separated by tabulation character. Which will tokenize the components of each book. Then by comparison between what is entered by the user depend on the type of operation, the result will be displayed.

Example of books file is shown below.

Table(1) books file

Author	Title	subject	publisher	ISBN	ID book	status
Ali.M	signals	communication	Sharjah 2000	00012	1.1	available
Hassam .B	C++ LNG	programming	Dubai 1999	00013	1.2	not available

In addition there is a file called borrowed file which contains the list of borrowed books from the library. So if the user would like to borrow a book he should interact with borrowed file to check the status of the book. So any thing took out from the library it could be register in this file. by this file when the user came to borrow a book and he didn't find, he can return to a borrowed file as a reference to check if the book is in the list or not.

Example of borrowing file is shown below:

Table (2) borrowed file

Book ID	Student ID
1.26	1233
1.23	1221



The third file is a student file which contains a list of students allowed to access the library system. So when the user would like to borrow a book the program will go to the student file and check if the student is in the list or not, by this file it has to say that the borrowing process is limited to a specific group of users who are students.

An example of the file is shown below.

Table (3) student file

Students file	Name	year
1210	Ali Salem	3
1211	Ahmed Mohamed	3
1312	Salem Saeed	2
1413	Jsim Ahmed	1
1114	Adel Ahmad	4
1215	Waleed Saeed	3

## 2.3 Interface design

Interface has been developed using Xdialog, the first window that displayed to the user is main menu show all operations in the library. The operations are searching, borrowing, returning, addition and deleting from the library. When the user enters to search operation, the new window displayed all types of the search in the library. Also if the user chooses borrowing operation, the specific window for this operation will show to ask the user to enter the ID for both student and book. And this information will be send to the borrowing file in the database. For the returning operation, the user will be asked to enter the book ID only, and then the software will delete the ID for book and student from the borrowing file. In addition if the user enters to add section, the software will ask the user to enter all details of the book. Then this new book will be added to the books file in the database. Finally when the users choose deleting operation, he will be asked to enter the ID book only. We took an ID book because each book has different ID from another. Then the book will be deleted from the books file.



## **Chapter 3**

### **Implementation**

The whole program was implemented using C++ programming language under Linux.

The header files that have been used in implementing the program are:

```
#include <iostream.h>    // input/output stream
#include <fstream.h>     // file processing and manipulations
#include <string.h>      // string stream
```

The implementation of library management software divides into two main parts, the first one is the functions implementation and the second one is interface implementation.

### **3.1 Functions Implementation**

The library management software consists in five main functions, which are search function, borrow function, return function, add new book function and delete function from the library function.

#### **3.1.1 Search function**

In the search function the software will give the user four choices which are search by author, search by title, search by subject and search by cross method. After the user chooses the type of search then the software will ask him to enter an input for this type. Then it will take this input and store in string. After that the software will go to the books file and read line by line using `cin.getline`. Then it will take each line and divide it into seven strings using the `strtok` function (which read the input from the file until the tap coming so each string will separate from another string by tap (“\t”). The first string is the name of the author, the second string is the title of the book, the third string subject, the forth string is publisher, the fifth string is ISBN of the book, the sixth string is identifier number of the book and the last string is status of the book. For the first



three types of search the software will take the input entered by the user and compare it with one of seven strings using strcmp function according to the type that the user choose. For example if the user chooses to search by author the software will compare the input with the author string and the same for search by title and search by the subject. For the last type of the search which is search by cross method the user will enter three inputs. Then the software will compare the first input with author string and the second input with title string and the last input with subject string using strcmp function. When the comparison process finish if the input matches any information from the books then the software will display this information to user in the screen, otherwise it will send a message to user that this book is not available.

### **3.1.2 Borrow function**

In the borrow operation the software will ask the user to enter the book Id and student Id then it will store each one of them in a string. After that the software will go to the borrowed file and read it line by line using cin.getline. Then it will divide each line into two strings the first string will be the book Id string and the second one will be the student Id string. After that the software will take the book Id and compare it with all books Ids taken from the file using strcmp. If it finds the same Id it will send message to the user that this book was borrowed, otherwise the software will go to the students file and read it line by line using cin.getline and then it will divide it into strings using the strtok function. The first string will be the student Id. The software then will take the student Id entered by the user and compares it with the string of the student taken from the students file using strcmp and if it the same the software will go and add a line consist of two strings the first one is for book Id and the second one is for the student Id to the borrowed books file. On the other hand if the student Id entered by the user not match any student Id from the file then the software will send message to the user telling him that student Id is wrong.



### **3.1.3 Return function**

In the return function the software will ask the user to enter the book Id and student Id. Then it will store each one of them in a string. After that the software will go to the borrowed books file and reads it line by line using `cin.getline`. Then it will divide each line into two strings the first string will be the book Id string and the second one will be the student Id string. Then the software will take the book Id and compare it with all books Ids taken from the borrowed books file using `strcmp`. If it doesn't match any book Id from the borrowed books file then the software will send a message to the user telling him that this book Id is wrong, otherwise if the book Id entered by the user match the book Id from the borrowed books file the software will take the student Id beside this book Id and compare it with the student Id entered by the user using `strcmp` function. If these two Ids are not the same then the software will send a message to the user telling him that the student Id is wrong, but if they are the same then the software will delete this line from the borrowed books file. Delete the line takes many steps; first the software will read the borrowed books file line by line using `cin.getline`. Then it will divide it into two strings the first one is the book Id string and the second one is the student Id string. Then the software will compare book Id in each line with Book Id entered by the user and if it not the same Id the software will wrote it in a temporary file. When the software reaches the end of the borrowed file it will go to the temporary file and read it line by line and wrote this lines in the borrowed file. Like this the software will delete the line that contain the book Id and the student Id that are entered by the user.

### **3.1.4 Add book**

In the add book function the software will ask the user to enter the book details (author, title, subject, publisher, ISBN, Identifier number and status of the book). Then the software will store each part of the details in a string. After that the software will take the book Id string and enter it in a for loop and check each digit if it number or not. If at



least one digit is not a number then the software will send a message to the user telling him that the book Id must be a number. On the other hand if all digits are numbers then the software will write all the details in the books file.

### **3.1.5 Delete book**

Delete book from the library take many steps. First the software will ask the user to enter only the identifier number of the book because each book in the library has a different identifier number so no need to ask the user to enter all details of the book. After the software read the input from the user it will go to the books file and read it line by line using `cin.getline`. Then it will divide it into seven strings using `strtok` function the sixth string is the book Id string. The software will take the book Id string and compares it with Book Id entered by the user. If it is not the same Id the software will write it in a temporary file. When the software reaches the end of the books file it will go to the temporary file and read it line by line and write this lines in the books file. Like this the software will delete book from the books file.

## **3.2 Interface Implementation**

The interface of the library management software was implemented using `Xdialog` in the Linux. The header file is `#!/bin/bash`. Where the screen can be manipulated using the following commands:

`Xdialog - - title` to write the title of the window.  
`Xdialog - - inputbox` to show the input message to the user.  
`Xdialog - - textbox` to show the output to the user.  
`Xdialog - - backtitle` to show the title of inner window.  
`Xdialog - - infobox` to show the output to the user.

All these commands used to implement the interface of the library management software. In the interface of the user click (cancel) icon or (X) and this done using he



will close the window and go out the software. The three lines below show the cancel and (X) code.

```
if [ $? = 1 -o $? = 255 ] ; then  
/bin/rm /tmp/main.$$  
exit
```

So if user click cancel icon which is in this code (1) or (X) which is in this code (255) the window will be closed.

The functions of the software were implemented separately. Each function was implemented in separate file. And that because the code of the interface call each function separately. So when the user clicks in the search function the search program will be called and like this for other functions. Calling function shown in the code below.

#### **author \$auth**

The file name is author. And auth is a variable that the software takes from the command line. So the interface calls the required program by write the file name follow by the input for the program.

The interface of the software will give the user five choices, which are the functions of the software. If the user chooses any function and click on (ok) icon then this function will be called and the user will be allowed to do its process. The snapshot shown in figure (15) shows the first window of the software.

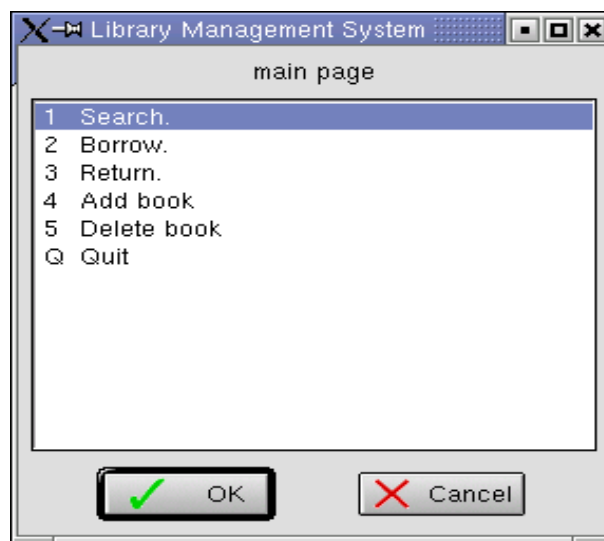


Fig. (15) main page



If the user clicks on each one of the software functions then a small window will appear to the user to enter the input for this function. For example if the user chooses borrow function. Then the snapshot shown in figure (16) below will appear.

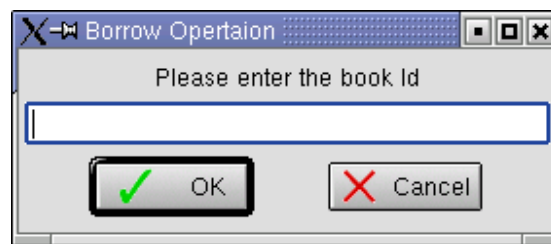


Fig. (16) input message

In this window the software ask the user to enter the book Id as an input for this operation. After the software takes the book Id as an input it will ask the user to enter the student Id as a second input for this function.

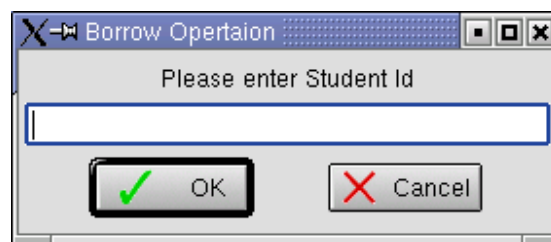


Fig. (17) input message

The snapshot above shows the process of asking the user to enter the student Id. If the borrow function done successful then a message will appear to the user in small window as shown in figure (18) below.

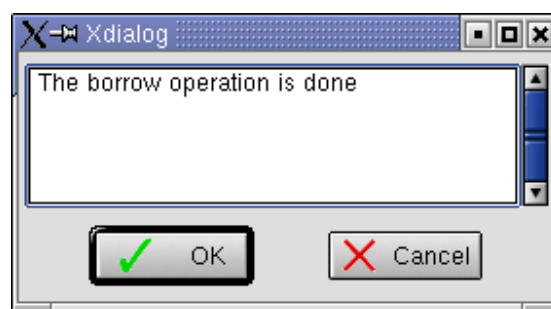


Fig (18) output message





## **Chapter 4**

### **Project results**

#### **4.1 Advantages of library management software**

##### **4.1.1 Manage the library**

The main goal of creating the library management software is to manage the operations done in the library, which are searching for a book, borrowing a book and returning a book. All these operations can be done without using this software, but doing these operations may need a lot of time and offered.

##### **4.1.2 Saving time**

Using library management software will save a lot of time for the both students and Librarian. It will save the time of the students because they can stay in the front of the computer and search for the required book and the software will print out the details of this book if this book is available in the library. And if it is not available in the library the software will also save the student's time by telling them that this book is not available so they will not spend their time searching for a book which is not available in the library. Imagine if they don't have this software they will spend a lot of time searching for a book from one shall to another. Also this software will save the time of the Librarian because it will allow him to do many things in a few seconds like search for borrowed books, check the student Id and the book Id. If the Librarian doesn't has this software he will spend a lot of time searching in the papers for the student Id or book Id.



### **4.1.3 Search choices**

The library management software gives the user four choices for search which are search by author, search by title, search by subject and search by cross method. This is advantage for this software because the user may search for a book in specific subject and he don't care about the title so he will use search by subject or he may looking for books written by specific author so he will choose search by author. The last type of search which is the cross method is the great advantage of this software because it allow the user to search for the required book using the other three type together so the user may enter the subject and part of the title and part of the author's name then the software will search for these information and display the result in the screen.

### **4.1.4 Automatic data searching**

After the user enters the book Id the library management software will check this Id to make sure that it is a number and if it is number then the software will complete the process, on the other hand if it is not a number it will send a message for the user telling him that the book Id must be a number and then end the process. This option is a benefit option because the user may enter characters instead of numbers by mistake so the software will tell him that he enter character instead of number and the book Id must be a number.

## **4.2 Limitation of Library Management System**

### **4.2.1 Limit to Linux platform**

The library management software is limited to the Linux platform. The reason for this is the implementation of the interface which was implemented using Xdialog in Linux. So the software cannot be used in windows platform.



#### **4.2.2 Limit to use by Librarian**

This library management software does not have security system so if user by the student they can enter to the function which not allowed to them like the add book. So this software will be limited to use by the Librarian and he can do the functions to the student like search function.

#### **4.2.3 Limited Database**

The database of this software was limited because it has only details for books. So it has not information about magazines and video which are in the library.

### **4.3 Recommended improvements**

#### **4.3.1 Implement interface in the windows**

It is recommended to implement the interface in the Microsoft windows using visual basic or visual C++.

#### **4.3.2 Add security system**

Adding security system will manage the software. So using the software will be allowed to both student and Librarian. This security system will check the password and define the kind of user. If student is the user then the software will allow him to do the search operation only. Otherwise if Librarian is the user the software will allow him to do all the operations.



#### **4.3.3 Create full database**

The database of this software has only details about the books available in the library. So it is recommended to create a database, which includes details about the magazines and video films that available in the library. So it will simplify the work of the Librarian.

#### **4.3.4 Add reserve operation**

The reserve operation will add more quality for the library management software. This operation allows the user to reserve a book which is borrowed by another student. So when the second student returns the book the software will reserve this book to the first student. The software will reserve the book for few days and if the student does not come to borrow it the software will cancel the reservation.

#### **4.3.5 Connect the software to the internet**

The software can be more useful if it connect to the Internet. So the user can enter the site in the Internet and make any function he need. He can search for a book or borrow. By this the software can be used from any person from any location.



## **Conclusion**

Library management system is software help the users to use the library in easy way; the user can search, borrow, return, add and delete books from the library.

The aim of this project is to develop software to manage the library. The implementation of the software (Library Management System) was completed successfully, so the library will manage now by using software and the user will allow now using the library in easy way, he can search for the books, borrow and return books and add and delete books in the library. The problems also were solved.

There are some improvements and recommendations for o the library management system to be done in the future. The first improvement is to add another operation to the system which is reserve operation. This operation allows the student to reserve a book, which was borrowed, by another student. The second improvement is to design a full database contains all video films and magazines available in the library in addition to the books. It is also recommended to implement the interface using visual basic or visual C++ because this will increase the users of this software.



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