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# Mini Project Report

**Title:** Library Management System.

## Description :

The Library Management System using File Handling in C++ is a console-based mini project designed to automate the process of managing book records in a library. This system provides an efficient way to handle large amounts of book information such as Book ID, Title, Author, and Price. It allows the librarian or user to add new books, display all records, search for a specific book, update existing details, and delete unwanted records. All data is stored permanently in a binary file, ensuring that the records remain safe even after the program is closed.

The project demonstrates the core concepts of file handling in C++, including file creation, reading, writing, and updating binary files. It replaces manual record-keeping with an easy-to-use menu-driven interface that makes operations simple and user-friendly. The use of object-oriented programming features like classes and objects ensures data encapsulation and code reusability. This system also highlights the importance of persistent storage without the need for complex databases.

Overall, the Library Management System serves as a practical example for students and beginners to understand how file handling can be applied to real-world problems. It improves efficiency, reduces manual effort, and provides a structured way to manage library data digitally. The project not only strengthens programming and logical thinking skills but also lays a foundation for developing larger database-driven management systems in the future.

## Submitted By:

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## Code :

```cpp
#include <iostream>
#include <fstream>
#include <sstream>
#include <string>
using namespace std;

class Book {
public:
    int id;
    string title, author;

    void input() {
        cout << "\nEnter Book ID: ";
        cin >> id;
        cin.ignore();
        cout << "Enter Book Title: ";
        getline(cin, title);
        cout << "Enter Author Name: ";
        getline(cin, author);
    }

    void show() {
        cout << "\nBook ID   : " << id;
        cout << "\nBook Title: " << title;
        cout << "\nAuthor    : " << author << "\n";
    }
};

void addBook() {
    Book b;
    b.input();

    ofstream fout("library.txt", ios::app);
    fout << b.id << "|" << b.title << "|" << b.author << endl;
    fout.close();

    cout << "\n✅ Book added and stored successfully!\n";
}

void viewBooks() {
    ifstream fin("library.txt");
    if (!fin) {
        cout << "\n⚠ No Books Found!";
        return;
    }

    string line;
    cout << "\n📚 LIST OF BOOKS:\n";

    while (getline(fin, line)) {
        Book b;

        int p1 = line.find("|");
        int p2 = line.find("|", p1 + 1);

        string idStr = line.substr(0, p1);
        stringstream ss(idStr);
        ss >> b.id;

        b.title = line.substr(p1 + 1, p2 - p1 - 1);
        b.author = line.substr(p2 + 1);

        b.show();
        cout << "--------------------------------\n";
    }
    fin.close();
}

void searchBook() {
    ifstream fin("library.txt");
    if (!fin) {
        cout << "\n⚠ No Books Found!";
        return;
    }

    int searchID;
    cout << "\nEnter Book ID to Search: ";
    cin >> searchID;

    string line;
    bool found = false;

    while (getline(fin, line)) {
        Book b;
        int p1 = line.find("|");
        int p2 = line.find("|", p1 + 1);

        string idStr = line.substr(0, p1);
        stringstream ss(idStr);
        ss >> b.id;

        b.title = line.substr(p1 + 1, p2 - p1 - 1);
        b.author = line.substr(p2 + 1);

        if (b.id == searchID) {
            cout << "\n✅ Book Found:\n";
            b.show();
            found = true;
            break;
        }
    }

    if (!found)
```

```cpp
        cout << "\n❌ Book Not Found!";
}
void deleteBook() {
    ifstream fin("library.txt");
    if (!fin) {
        cout << "\n⚠ No Books to Delete!";
        return;
    }
    int delID;
    cout << "\nEnter Book ID to Delete: ";
    cin >> delID;

    ofstream temp("temp.txt");
    string line;
    bool deleted = false;

    while (getline(fin, line)) {
        int p = line.find("|");
        string idStr = line.substr(0, p);
        int fileID;
        stringstream ss(idStr);
        ss >> fileID;

        if (fileID != delID)
            temp << line << endl;
        else
            deleted = true;
    }
    fin.close();
    temp.close();

    remove("library.txt");
    rename("temp.txt", "library.txt");

    if (deleted)
        cout << "\n✅ Book Deleted Successfully!";
    else
        cout << "\n❌ Book ID Not Found!";
}
int main() {
    int choice;
    while (true) {
        cout << "\n===== LIBRARY MANAGEMENT SYSTEM =====";
        cout << "\n1. Add Book";
        cout << "\n2. View All Books";
        cout << "\n3. Search Book";
        cout << "\n4. Delete Book";
        cout << "\n5. Exit";
        cout << "\nEnter Your Choice: ";
        cin >> choice;

        switch (choice) {
            case 1: addBook(); break;
            case 2: viewBooks(); break;
            case 3: searchBook(); break;
            case 4: deleteBook(); break;
            case 5: cout << "\n👋 Thank You! Exiting...\n"; return 0;
            default: cout << "\n❌ Invalid Choice!";
        }
    }
}
```

Output :



```
ubuntu@ubuntu-OptiPlex-3020: ~/sru
ubuntu@ubuntu-OptiPlex-3020:~/sru$ g++ mp.cpp
ubuntu@ubuntu-OptiPlex-3020:~/sru$ ./a.out

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 1

Enter Book ID: 12
Enter Book Title: complete reference c++
Enter Author Name: herbert schild

✓ Book added and stored successfully!

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 1

Enter Book ID: 13
Enter Book Title: tcp/ip protocol suite
Enter Author Name: behrouz a. forouzen

✓ Book added and stored successfully!

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 2
```

```
ubuntu@ubuntu-OptiPlex-3020: ~/sru
✓ Book added and stored successfully!

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 1

Enter Book ID: 13
Enter Book Title: tcp/ip protocol suite
Enter Author Name: behrouz a. forouzen

✓ Book added and stored successfully!

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 2

📖LIST OF BOOKS:

Book ID   : 12
Book Title: complete reference c++
Author    : herbert schild
.................................

Book ID   : 13
Book Title: tcp/ip protocol suite
Author    : behrouz a. forouzen
.................................

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice:
```

## Terminal — buntu@ubuntu-OptiPlex-3020: ~/sru

```
Book ID  : 13
Book Title: tcp/ip protocol suite
Author    : behrouz a. forouzen
.................................

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 3

Enter Book ID to Search: 12

✓ Book Found:

Book ID  : 12
Book Title: complete reference c++
Author    : herbert schild

===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 4

Enter Book ID to Delete: 13

✓ Book Deleted Successfully!
===== LIBRARY MANAGEMENT SYSTEM =====
1. Add Book
2. View All Books
3. Search Book
4. Delete Book
5. Exit
Enter Your Choice: 5

👋Thank You! Exiting...
ubuntu@ubuntu-OptiPlex-3020:~/sru$
```

## library.txt (~/sru) - gedit

Open ▼

exception.cpp

```
12|aab|cbnvgfsuyf
```