LIBRARY SYSTEMS MANAGEMENT

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In partial satisfaction of the requirements for the degree of

BACHELOR OF TECHNOLOGY
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with specialization in Software Engineering

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KATTANKULATHUR - 603203

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KATTANKULATHUR-603203

BONAFIDE CERTIFICATE

Certified that **21CSC101T OBJECT ORIENTED DESIGN AND PROGRAMMING project report** titled **"LIBRARY SYSTEM MANAGEMENT"** is the bonafide work done by _____ who completed the project under my supervision. Certified further, that to the best of my knowledge, the work reported herein does not form part of any other work.

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Problem Statement

Implementation of the Library Management System which provides the user to select any one of the operations like issue, return, find, register and buy a book. This involves:

- Class
- Object
- Encapsulation
- Abstraction
- Inheritance
- Polymorphism

Modules of Project

The modules of the above code can be identified as follows:

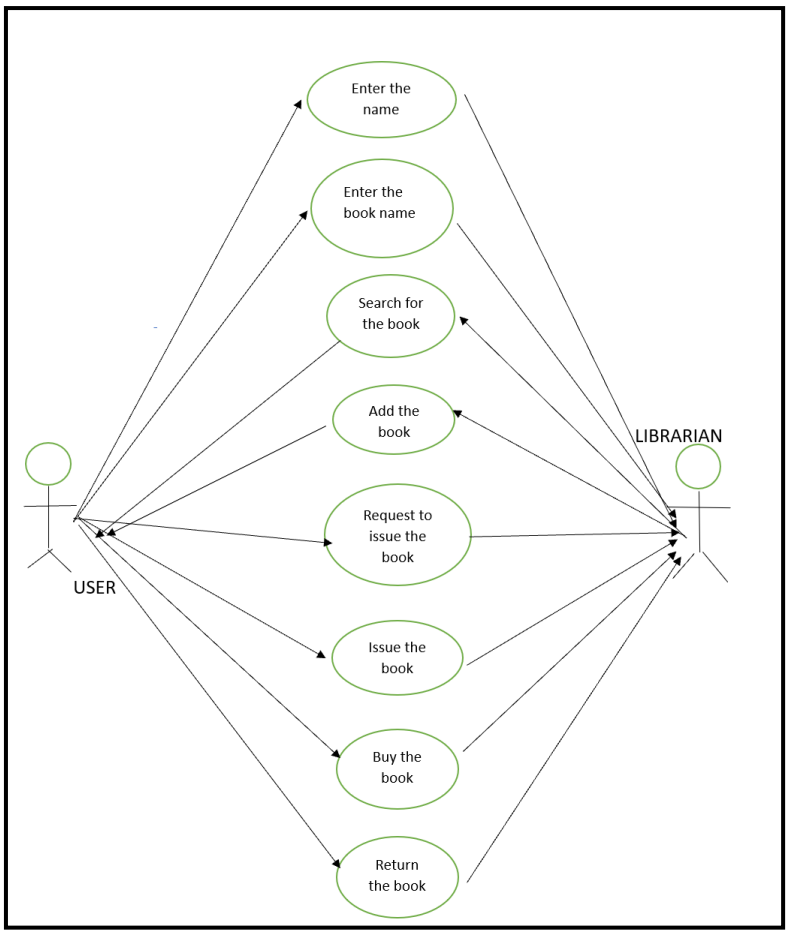
- Library class:
    - issue_book() method = To issue a book from the library
    - return_book() method = To return a book to the library
    - find_book() method = To find a book in the library
    - register_book() method = To register a new book in the library
    - buy_book() method = To buy a book from the library

- Main function:
    - Takes the user's name as input
    - Displays a menu of available options

- Calls the appropriate method of the library class based on user input
- Each function represents a module or operation that can be performed by the library system. The main function acts as the driver program that interacts with the user and calls the appropriate functions based on the user's choice

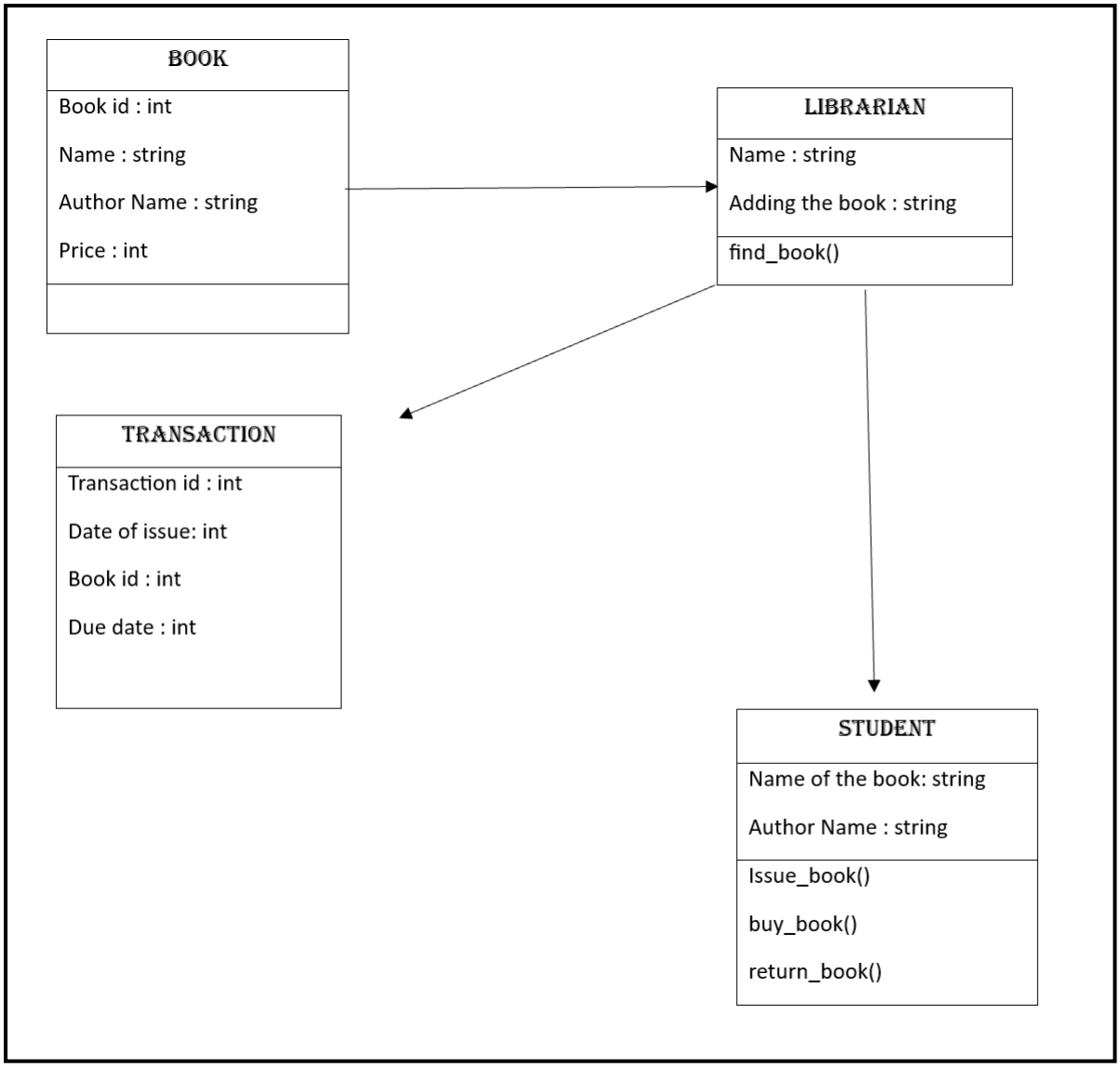
Use Case Diagram

A use case diagram is a graphical representation of the interactions between a system and its actors (users or other systems) in order to achieve a specific goal or objective. It is a high-level diagram that shows the functionality of a system and the actors who interact with it. Use case diagrams are typically used in software development to identify and define the system requirements, and to communicate those requirements to stakeholders in a clear and concise way.



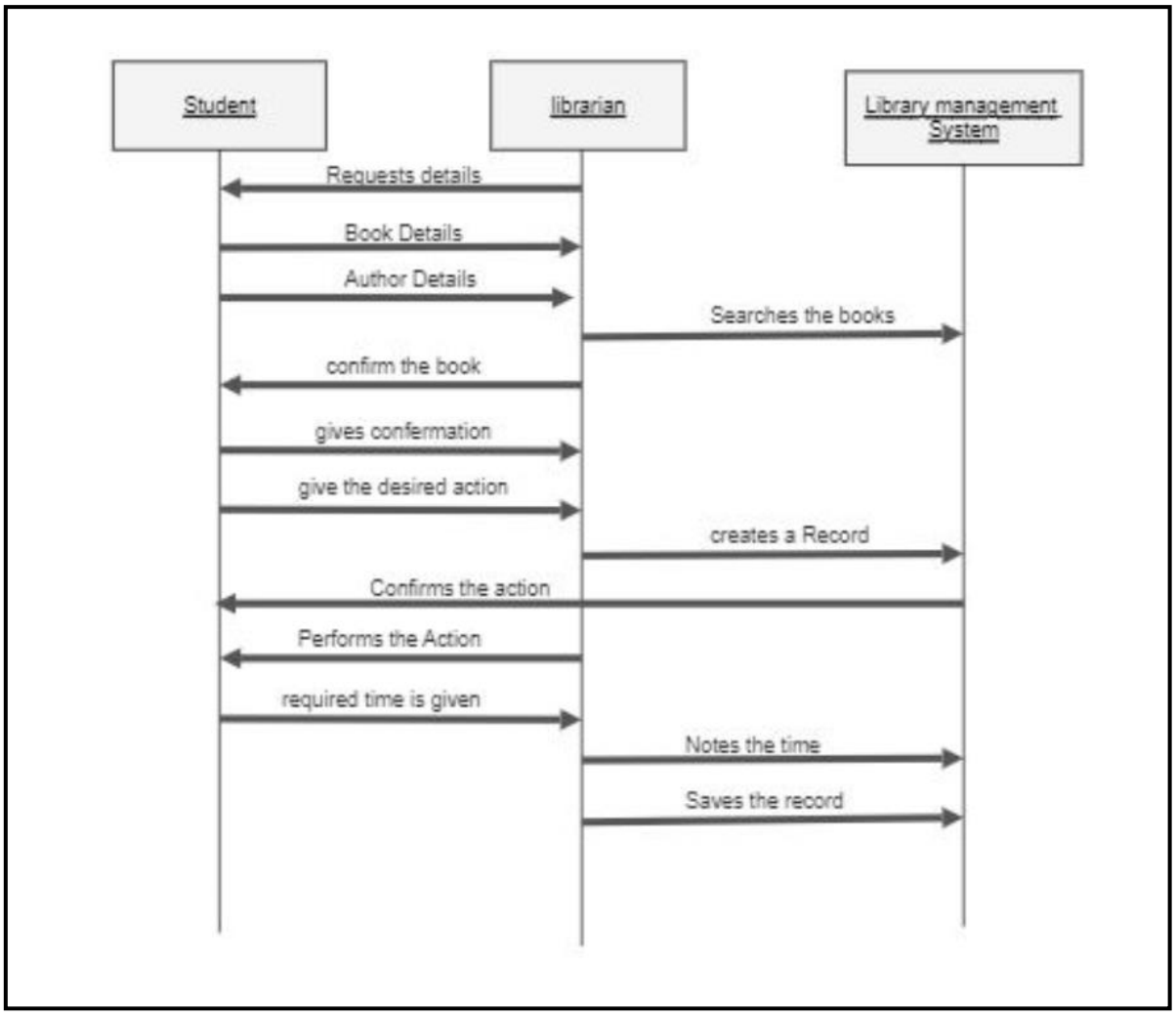
Class Diagram

A class diagram is a graphical representation of the classes, interfaces, associations, and collaborations in a system or software application. It provides a high-level view of the system's architecture and can help developers to better understand the relationships between different classes in the system.


BOOK
Book id : int
Name : string
Author Name : string
Price : int
LIBRARIAN
Name : string
Adding the book : string
find_book()
TRANSACTION
Transaction id : int
Date of issue: int
Book id : int
Due date : int
STUDENT
Name of the book: string
Author Name : string
Issue_book()
buy_book()
return_book()

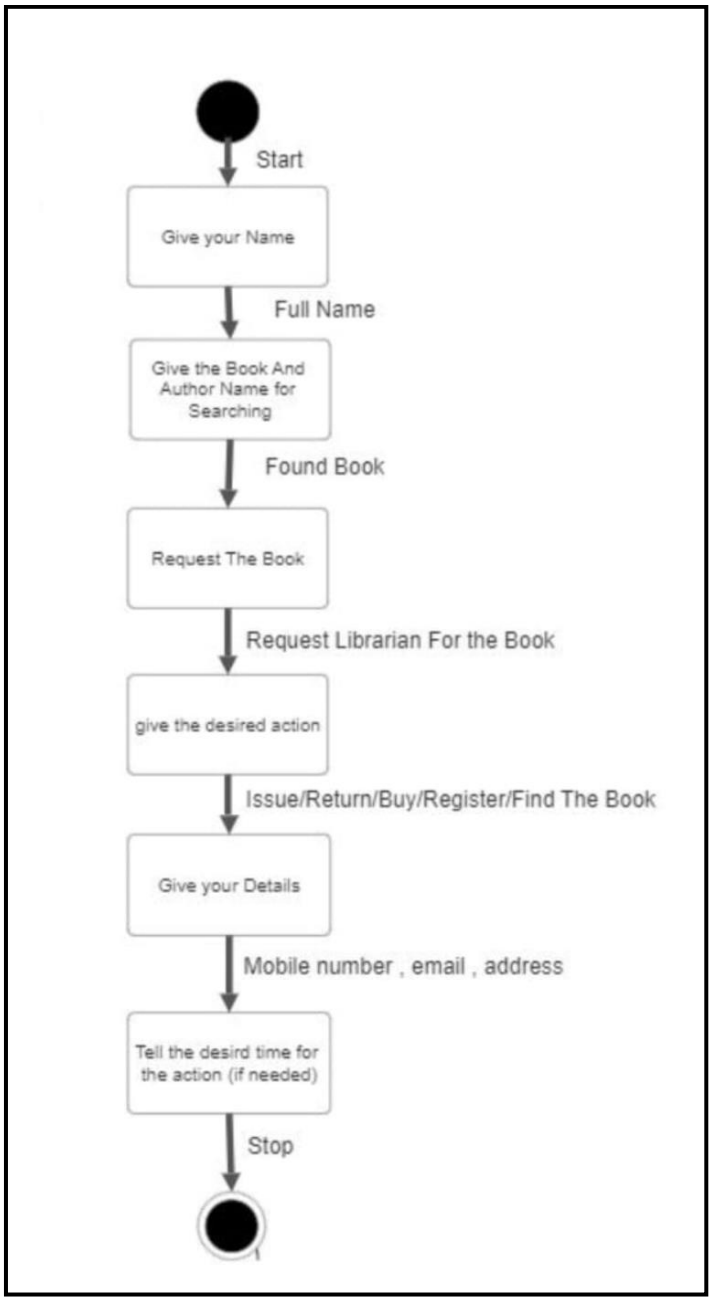
Sequence Diagram

A sequence diagram is a type of interaction diagram that shows how objects interact with each other in a particular scenario or sequence of events. It is a graphical representation of the flow of messages or method calls between objects in a system. This consists of a vertical timeline representing time from top to bottom, and a horizontal line representing the objects or actors involved in the interaction. The messages exchanged between the objects or actors are represented as arrows on the diagram, with the arrowhead indicating the direction of the message.



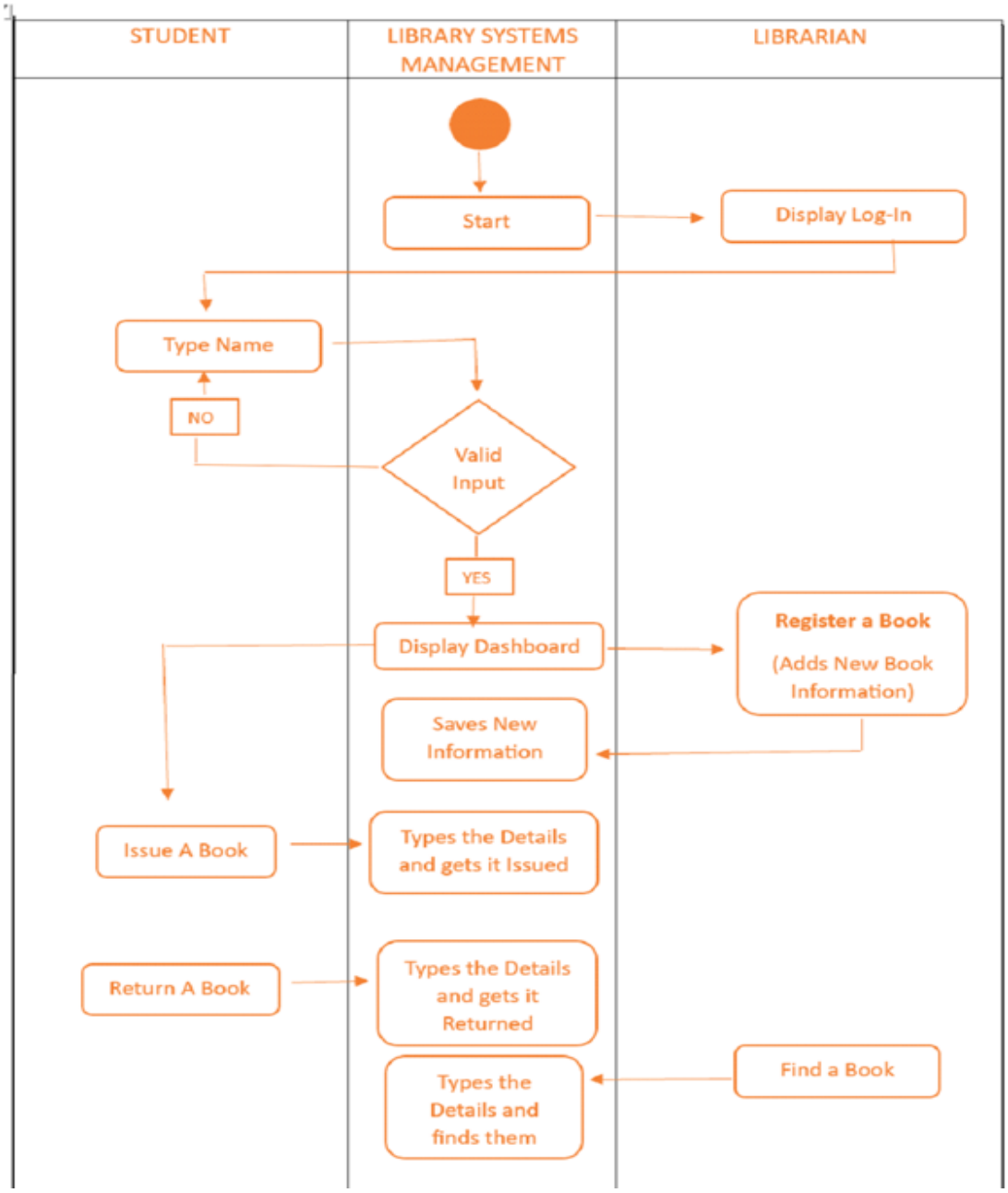
State Chart Diagram

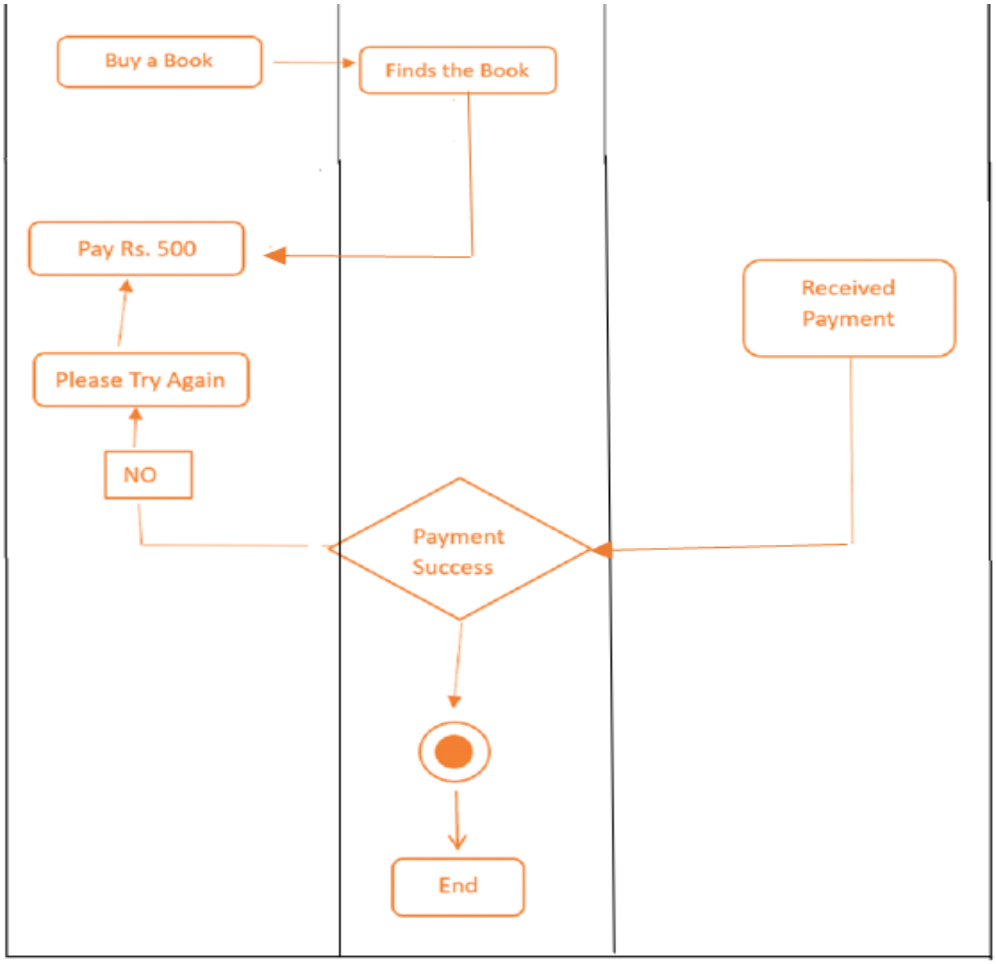
A state chart diagram is a type of behavioral diagram in Unified Modelling Language (UML) that depicts the different states and transitions of an object or system over time. It provides a visual representation of the states an object can be in and the events that trigger transitions between those states.



Activity Diagram

An activity diagram is a type of behavior diagram in Unified Modelling Language (UML) that illustrates the flow of activities or actions in a system. It is a graphical representation of the steps or activities involved in a particular process or use case.


STUDENT
LIBRARY SYSTEMS MANAGEMENT
LIBRARIAN
Start
Display Log-In
Type Name
NO
Valid Input
YES
Display Dashboard
Register a Book
(Adds New Book Information)
Saves New Information
Issue A Book
Types the Details and gets it Issued
Return A Book
Types the Details and gets it Returned
Find a Book
Types the Details and finds them



Code Screenshots

```cpp
#include <cmath>
#include <cstdio>
#include <bits/stdc++.h>
#include <cstring>
#include <iostream>
#include <fstream>
#include <conio.h>
#include <stdlib.h>
#include <algorithm>
using namespace std;

class SRM_lib{
    public:
    string name;
    void issue_book();
    void return_book();
    void find_book();
    void register_book();
    void buy_book();
};

```

```cpp
void SRM_lib::issue_book(){
    string book;
    string author;
    cout<<"Enter name of book you want to issue."<<endl;
    cin.ignore();
    getline(cin,book);
    cout<<"Enter name of the Author of the book you want to issue."<<endl;
    getline(cin,author);
    system("cls");
    cout<<"The "<<book<<" by the Author "<<author<<" is issued by "<<name<<" sucessfully"<<endl;
    cout<<"You should return or reissue the book within a week to not impose a fine!";
}

void SRM_lib::return_book(){
    string book;
    string author;
    string ans;
    cout<<"Enter name of book you want to return."<<endl;
    cin.ignore();
    getline(cin,book);
    cout<<"Enter name of the Author of the book you want to return."<<endl;
    getline(cin,author);
    system("cls");
    cout<<"The "<<book<<" by the Author "<<author<<" is returned by "<<name<<" sucessfully."<<endl;
    cout<<"Thank you for using our library."<<endl<<" Do you want to issue the book?"<<endl;
    cin>>ans;
```

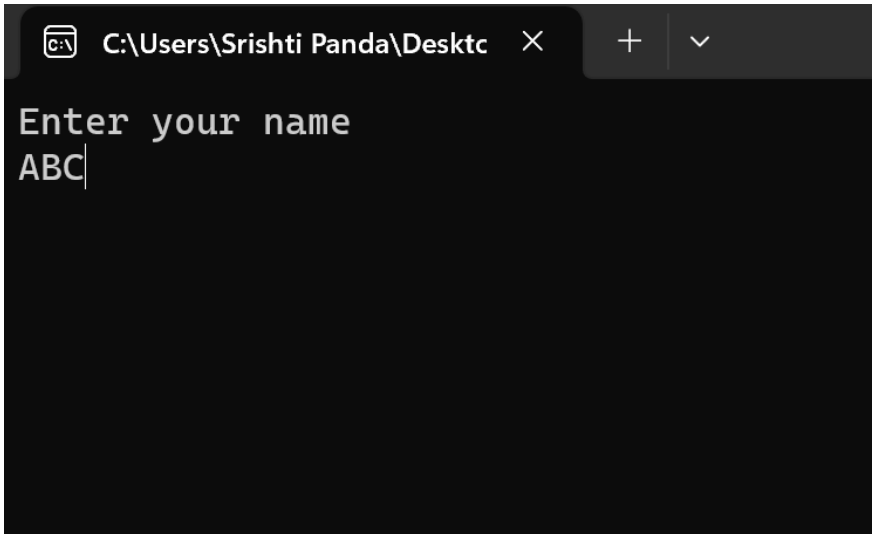
```
48      if (ans=="yes"||ans=="Yes"||ans=="YES"){
49          system("cls");
50          return issue_book();
51      }
52      else if (ans=="no"||ans=="No"||ans=="NO") {
53          system("cls");
54          cout<<"Thank you for using our library, "<<name<<".";
55      }
56  }
57
58  void SRM_lib::find_book(){
59      string book;
60      string author;
61      string ans;
62      cout<<"Enter name of book you want to find."<<endl;
63      cin.ignore();
64      getline(cin,book);
65      cout<<"Enter name of the Author of the book you want to find."<<endl;
66      getline(cin,author);
67      system("cls");
68      cout<<"The "<<book<<" by the Author "<<author<<" is available in the library."<<endl
69      <<"Do you want to issue the book?"<<endl;
70      cin>>ans;
71      if (ans=="yes"||ans=="Yes"||ans=="YES"){
72          system("cls");
73          cout<<"The "<<book<<" by the Author "<<author<<" is issued by "<<name<<" sucessfully"<<endl;
74          cout<<"You should return or reissue the book within a week to not impose a fine!";
75      }
```

```
76      else if (ans=="no"||ans=="No"||ans=="NO") {
77          system("cls");
78          cout<<"Thank you for using our library, "<<name<<".";
79      }
80  }
81
82  void SRM_lib::register_book(){
83      string book;
84      string author;
85      cout<<"Enter name of book you want to register."<<endl;
86      cin.ignore();
87      getline(cin,book);
88      cout<<"Enter name of the Author of the book you want to register."<<endl;
89      getline(cin,author);
90      system("cls");
91      cout<<"The "<<book<<" by the Author "<<author<<" is registered by "<<name<<" sucessfully."<<endl;
92      cout<<"The book is available in the library."<<endl;
93  }
94
95  void SRM_lib::buy_book(){
96      string book;
97      string author;
98      cout<<"Enter name of book you want to buy."<<endl;
99      cin.ignore();
100     getline(cin,book);
101     cout<<"Enter name of the Author of the book you want to buy."<<endl;
102     getline(cin,author);
103     system("cls");
104     cout<<"The "<<book<<" by the Author "<<author<<" is bought by "<<name<<" sucessfully."<<endl;
```

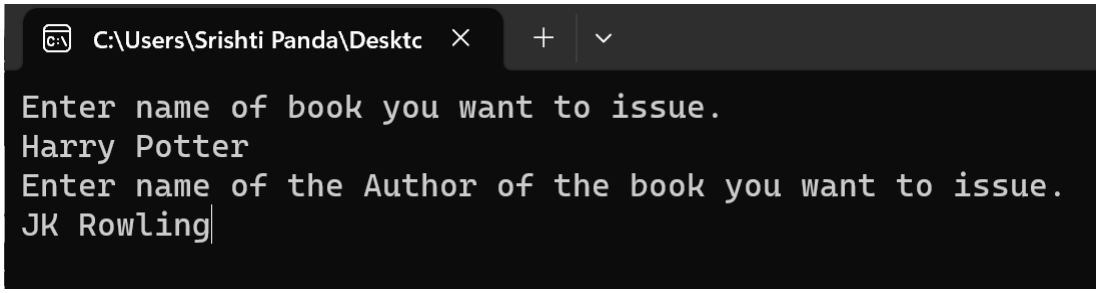
```
105     cout<<"Please pay 500 on the payment counter.";
106 }
107
108 int main(){
109     system("cls");
110      SRM_lib obj;
111     cout<<"Enter your name"<<endl;
112     getline(cin,obj.name);
113     int n;
114     system("cls");
115     cout<<"Welcome to the Library, "<<obj.name<<"."<<endl<<"Choose the action you want to perform:"<<endl
116     <<"1. Issue a book."<<endl<<"2. Return a book."<<endl<<"3. Find a book."<<endl<<"4. Register a book."
117     <<endl<<"5. Buy a book."<<endl<<endl;
118     cin>>n;
119     switch(n){
120         case 1:
121         system("cls");
122         obj.issue_book();
123         break;
124
125         case 2:
126         system("cls");
127         obj.return_book();
128         break;
129
130         case 3:
131         system("cls");
132         obj.find_book();
133         break;
```

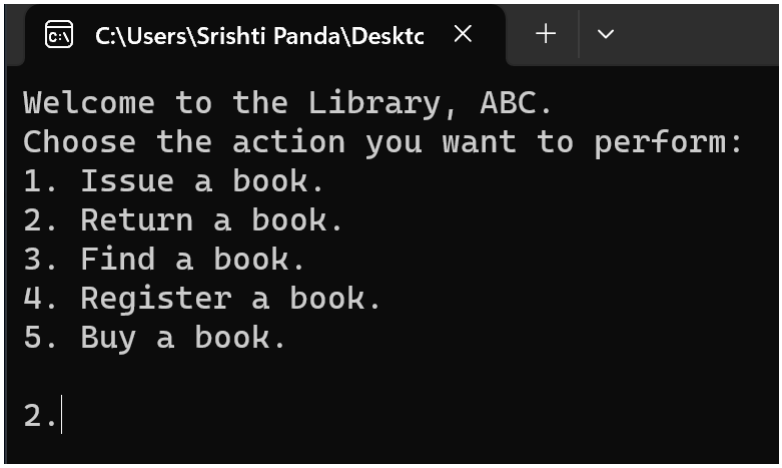
```
134
135          case 4:
136          system("cls");
137          obj.register_book();
138          break;
139
140          case 5:
141          system("cls");
142          obj.buy_book();
143          break;
144
145          defult:
146          system("cls");
147          cout<<"Thank you for using our library, "<<obj.name<<".";
148
149     }
150     return 0;
151 }
```

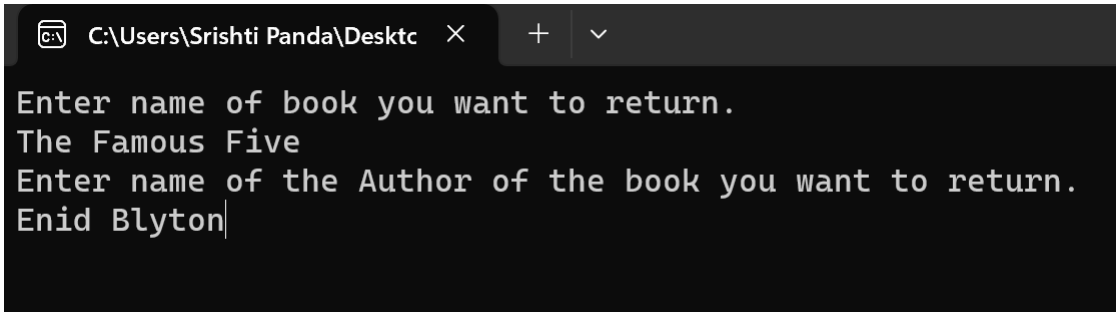
Output Screenshots

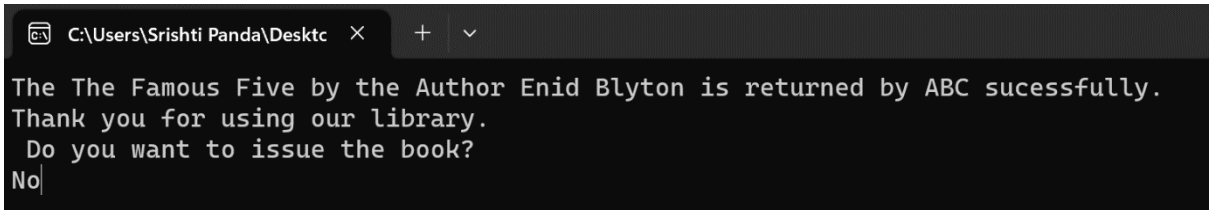


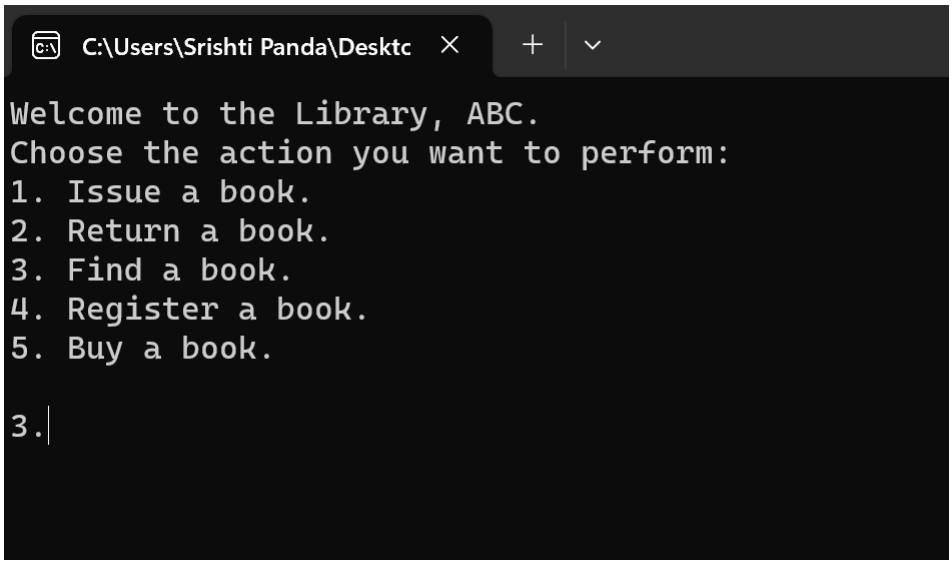

```
Welcome to the Library, ABC.
Choose the action you want to perform:
1. Issue a book.
2. Return a book.
3. Find a book.
4. Register a book.
5. Buy a book.

1.
```

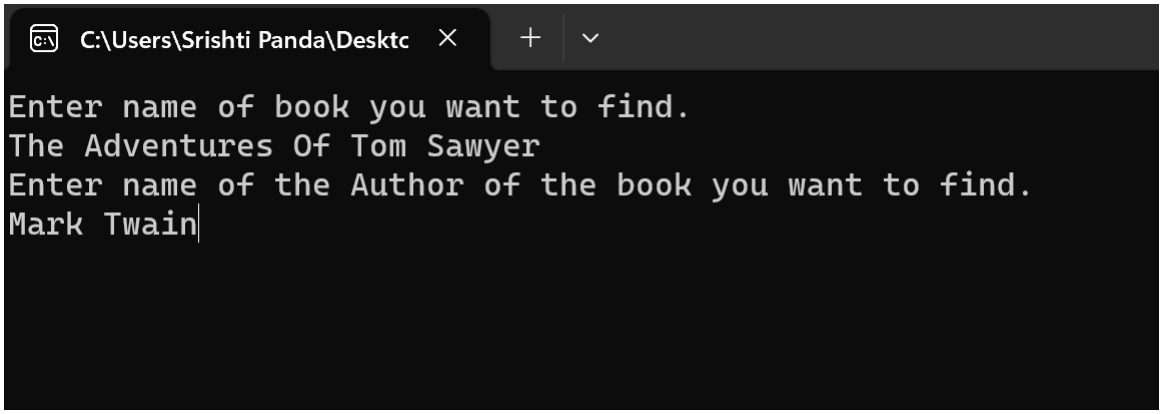


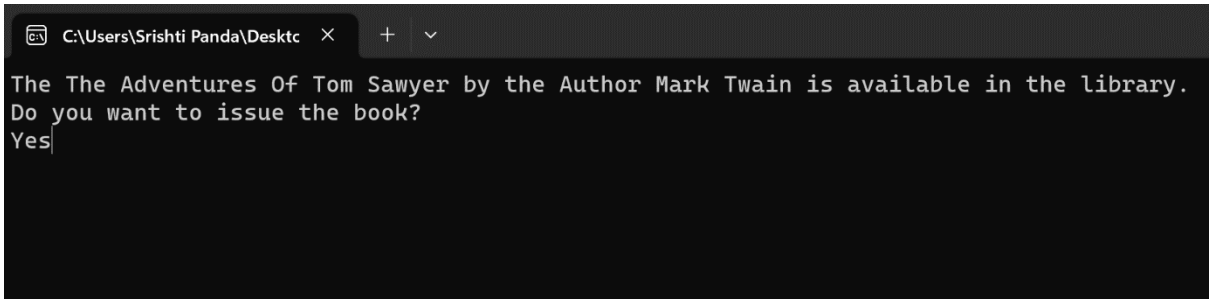


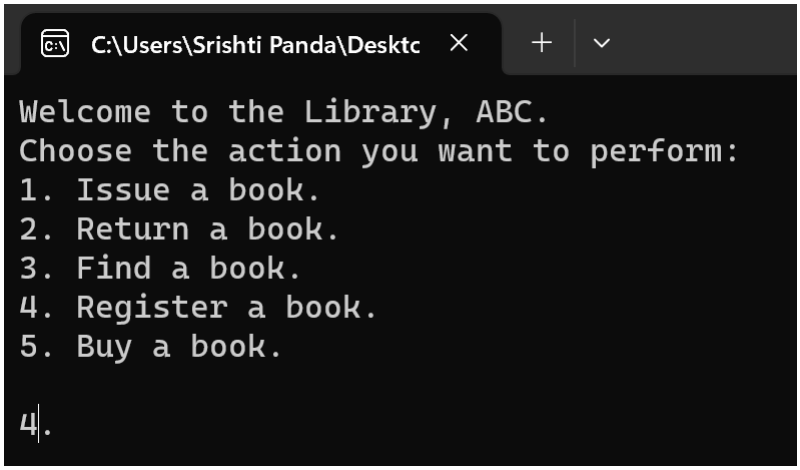

C:\Users\Srishti Panda\Desktc
Enter name of book you want to return.
The Famous Five
Enter name of the Author of the book you want to return.
Enid Blyton

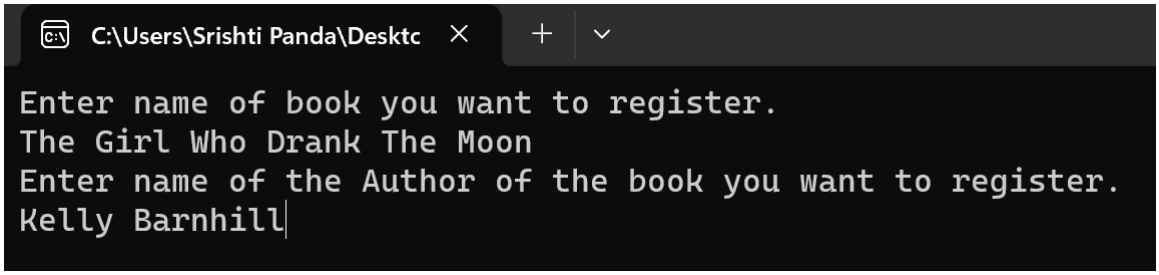

C:\Users\Srishti Panda\Desktc
The The Famous Five by the Author Enid Blyton is returned by ABC sucessfully.
Thank you for using our library.
Do you want to issue the book?
No

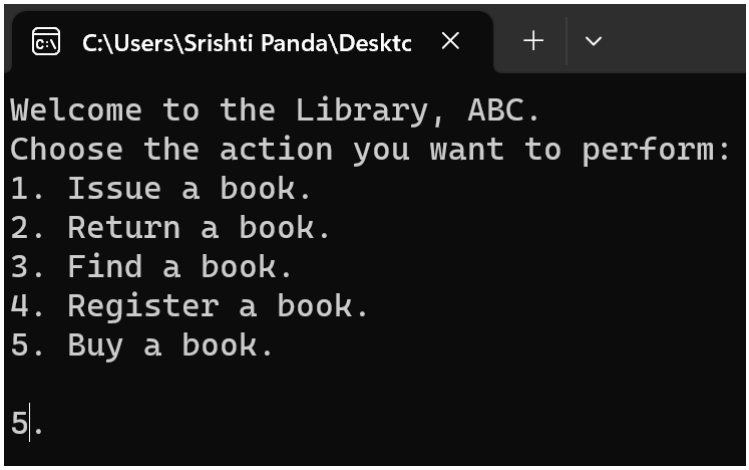

C:\Users\Srishti Panda\Desktc
Welcome to the Library, ABC.
Choose the action you want to perform:
1. Issue a book.
2. Return a book.
3. Find a book.
4. Register a book.
5. Buy a book.
3.

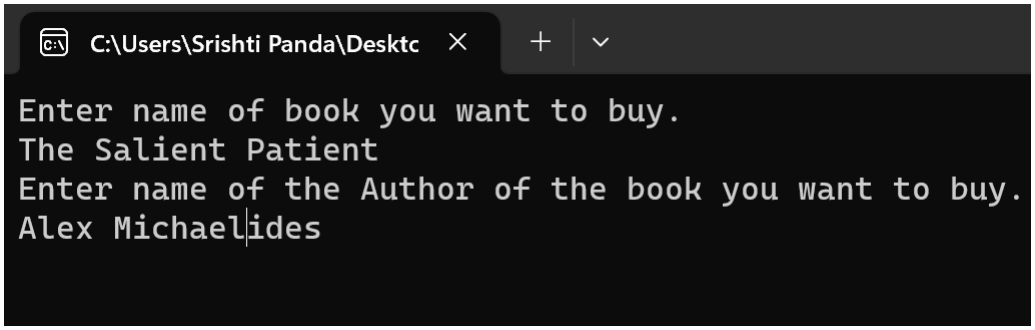

C:\Users\Srishti Panda\Desktc
Enter name of book you want to find.
The Adventures Of Tom Sawyer
Enter name of the Author of the book you want to find.
Mark Twain


C:\Users\Srishti Panda\Desktc
The The Adventures Of Tom Sawyer by the Author Mark Twain is available in the library.
Do you want to issue the book?
Yes









Conclusion and Results

- A simple Library System Management is achieved using C++ and its file system property.
- Library System Management is for computerizing the working in a library.
- The program takes care of all the requirements of a library and is capable to provide easy and effective storage of information related to books and users.
- The implementation of the system will reduce data entry time and provide readily calculated reports.

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References

Online Courses and eBooks Library (tutorialspoint.com)

GeeksforGeeks | A computer science portal for geeks

GitHub