# Simple Library Management System

```cpp
#include <iostream>

#include <string>


using namespace std;


struct Book {

    int id;

    string title;

    string author;

    bool isIssued;

    Book* next;



    Book(int id, string title, string author) {

        this->id = id;

        this->title = title;

        this->author = author;

        this->isIssued = false;

        this->next = 0;

    }

};


class Library {

private:

    Book* head;
```

```cpp
public:
  Library() : head(0) {}

  void addBook(int id, string title, string author) {
    Book* newBook = new Book(id, title, author);
    if (head == 0) {
      head = newBook;
    } else {
      Book* temp = head;
      while (temp->next != 0) {
        temp = temp->next;
      }
      temp->next = newBook;
    }
    cout << "Book added successfully!" << endl;
  }

  Book* searchBook(int id) {
    Book* temp = head;
    while (temp != 0) {
      if (temp->id == id) {
        return temp;
      }
      temp = temp->next;
    }
    return 0;
  }

  void issueBook(int id, string studentName) {
    Book* book = searchBook(id);
    if (book != 0) {
```

```cpp
        if (!book->isIssued) {

            book->isIssued = true;

            cout << "Book issued to " << studentName << endl;

        } else {

            cout << "Book is already issued!" << endl;

        }

    } else {

        cout << "Book not found!" << endl;

    }

}


void returnBook(int id) {

    Book* book = searchBook(id);

    if (book != 0) {

        if (book->isIssued) {

            book->isIssued = false;

            cout << "Book returned successfully!" << endl;

        } else {

            cout << "Book was not issued!" << endl;

        }

    } else {

        cout << "Book not found!" << endl;

    }

}


void listBooks() {

    if (head == 0) {

        cout << "No books in the library." << endl;

    } else {

        Book* temp = head;

        while (temp != 0) {
```

```cpp
        cout << "ID: " << temp->id << ", Title: " << temp->title << ", Author: " << temp->author
            << ", Status: " << (temp->isIssued ? "Issued" : "Available") << endl;
        temp = temp->next;
      }
    }
}


void deleteBook(int id) {
    if (head == 0) {
        cout << "No books in the library." << endl;
        return;
    }


    if (head->id == id) {
        Book* temp = head;
        head = head->next;
        delete temp;
        cout << "Book deleted successfully!" << endl;
        return;
    }


    Book* temp = head;
    while (temp->next != 0 && temp->next->id != id) {
        temp = temp->next;
    }


    if (temp->next != 0 && temp->next->id == id) {
        Book* toDelete = temp->next;
        temp->next = temp->next->next;
        delete toDelete;
        cout << "Book deleted successfully!" << endl;
```

```cpp
        } else {
            cout << "Book not found!" << endl;
        }
    }

    ~Library() {
        Book* temp = head;
        while (temp != 0) {
            Book* toDelete = temp;
            temp = temp->next;
            delete toDelete;
        }
    }
};

int main() {
    Library lib;
    int choice, id;
    string title, author, studentName;

    while (true) {
        cout << "\nLibrary Management System\n";
        cout << "1. Add New Book\n";
        cout << "2. Search for a Book\n";
        cout << "3. Issue a Book\n";
        cout << "4. Return a Book\n";
        cout << "5. List All Books\n";
        cout << "6. Delete a Book\n";
        cout << "7. Exit\n";
        cout << "Enter your choice: ";
        cin >> choice;
```

```cpp
switch (choice) {
    case 1:
        cout << "Enter Book ID: ";
        cin >> id;
        cin.ignore();
        cout << "Enter Book Title: ";
        getline(cin, title);
        cout << "Enter Book Author: ";
        getline(cin, author);
        lib.addBook(id, title, author);
        break;
    case 2:
        cout << "Enter Book ID to search: ";
        cin >> id;
        {
            Book* book = lib.searchBook(id);
            if (book != 0) {
                cout << "Book found! ID: " << book->id << ", Title: " << book->title
                    << ", Author: " << book->author << ", Status: "
                    << (book->isIssued ? "Issued" : "Available") << endl;
            } else {
                cout << "Book not found!" << endl;
            }
        }
        break;
    case 3:
        cout << "Enter Book ID to issue: ";
        cin >> id;
        cin.ignore();
        cout << "Enter Student Name: ";
```

```cpp
            getline(cin, studentName);

            lib.issueBook(id, studentName);

            break;

        case 4:

            cout << "Enter Book ID to return: ";

            cin >> id;

            lib.returnBook(id);

            break;

        case 5:

            lib.listBooks();

            break;

        case 6:

            cout << "Enter Book ID to delete: ";

            cin >> id;

            lib.deleteBook(id);

            break;

        case 7:

            return 0;

        default:

            cout << "Invalid choice!" << endl;

    }

  }


  return 0;

}
```

## *OUTPUT:-

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 1

Enter Book ID: 12210790

Enter Book Title: KALKI

Enter Book Author: NAG ASHWIN

Book added successfully!

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

Enter your choice: 1

Enter Book ID: 12212111

Enter Book Title: SALAAR

Enter Book Author: PRASHANTH NEEL

Book added successfully!

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

Enter your choice: 1

Enter Book ID: 12214252

Enter Book Title: SAAHO

Enter Book Author: SUJEETH

Book added successfully!

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 2

Enter Book ID to search: 12210790

Book found! ID: 12210790, Title: KALKI, Author: NAG ASHWIN, Status: Available

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 3

Enter Book ID to issue: 12212111

Enter Student Name: NANDHU

Book issued to NANDHU

Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 4

Enter Book ID to return: 12212111

Book returned successfully!


Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 5

ID: 12210790, Title: KALKI, Author: NAG ASHWIN, Status: Available

ID: 12212111, Title: SALAAR, Author: PRASHANTH NEEL, Status: Available

ID: 12214252, Title: SAAHO, Author: SUJEETH, Status: Available


Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 6

Enter Book ID to delete: 12214252

Book deleted successfully!


Library Management System

1. Add New Book

2. Search for a Book

3. Issue a Book

4. Return a Book

5. List All Books

6. Delete a Book

7. Exit

##Enter your choice: 7


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Process exited after 190.1 seconds with return value 0

Press any key to continue . . .