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#include <iostream>
#include <fstream>
#include <vector>
#include <string>
using namespace std;

class Book {
private:
    int bookID;
    string title;
    string author;
    bool isAvailable;

public:
    Book() {}
    Book(int id, string t, string a, bool avail = true)
        : bookID(id), title(t), author(a), isAvailable(avail) {}

    int getID() const { return bookID; }
    string getTitle() const { return title; }
    string getAuthor() const { return author; }
    bool getAvailability() const { return isAvailable; }

    void issueBook() {
        if (isAvailable) {
            isAvailable = false;
            cout << "Book issued successfully.\n";
        } else {
            cout << "Book is already issued.\n";
        }
    }

    void returnBook() {
        if (!isAvailable) {
            isAvailable = true;
            cout << "Book returned successfully.\n";
        } else {
            cout << "Book was not issued.\n";
        }
    }

    string toString() const {
        return to_string(bookID) + "|" + title + "|" + author + "|" + (isAvailable ? "1" : "0");
    }
```

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    static Book fromString(const string& data) {
        int id;
        string t, a;
        int avail;
        size_t pos1 = data.find("|");
        size_t pos2 = data.find("|", pos1 + 1);
        size_t pos3 = data.find("|", pos2 + 1);

        id = stoi(data.substr(0, pos1));
        t = data.substr(pos1 + 1, pos2 - pos1 - 1);
        a = data.substr(pos2 + 1, pos3 - pos2 - 1);
        avail = stoi(data.substr(pos3 + 1));

        return Book(id, t, a, avail == 1);
    }

    void display() const {
        cout << "ID: " << bookID
             << " | Title: " << title
             << " | Author: " << author
             << " | Status: " << (isAvailable ? "Available" : "Issued") << endl;
    }
};

class Library {
private:
    vector<Book> books;

    void loadFromFile() {
        ifstream file("books.txt");
        string line;
        while (getline(file, line)) {
            if (!line.empty()) {
                books.push_back(Book::fromString(line));
            }
        }
        file.close();
    }

    void saveToFile() {
        ofstream file("books.txt", ios::trunc);
        for (const auto& b : books) {
            file << b.toString() << endl;
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        }
        file.close();
    }

public:
    Library() {
        loadFromFile();
    }

    ~Library() {
        saveToFile();
    }

    void addBook() {
        int id;
        string title, author;
        cout << "Enter Book ID: ";
        cin >> id;
        cin.ignore();
        cout << "Enter Title: ";
        getline(cin, title);
        cout << "Enter Author: ";
        getline(cin, author);

        books.push_back(Book(id, title, author));
        cout << "Book added successfully.\n";
    }

    void issueBook() {
        int id;
        cout << "Enter Book ID to issue: ";
        cin >> id;
        for (auto& b : books) {
            if (b.getID() == id) {
                b.issueBook();
                return;
            }
        }
        cout << "Book not found.\n";
    }

    void returnBook() {
        int id;
        cout << "Enter Book ID to return: ";
```

```
    cin >> id;
    for (auto& b : books) {
        if (b.getID() == id) {
            b.returnBook();
            return;
        }
    }
    cout << "Book not found.\n";
}

void searchBook() {
    int choice;
    cout << "Search by 1. ID  2. Title : ";
    cin >> choice;
    cin.ignore();

    if (choice == 1) {
        int id;
        cout << "Enter ID: ";
        cin >> id;
        for (auto& b : books) {
            if (b.getID() == id) {
                b.display();
                return;
            }
        }
    } else {
        string title;
        cout << "Enter Title: ";
        getline(cin, title);
        for (auto& b : books) {
            if (b.getTitle() == title) {
                b.display();
                return;
            }
        }
    }
    cout << "Book not found.\n";
}

void showStatistics() {
    int total = books.size();
    int issued = 0, available = 0;
    for (auto& b : books) {
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            if (b.getAvailability())
                available++;
            else
                issued++;
        }
        cout << "Total Books: " << total
             << " | Available: " << available
             << " | Issued: " << issued << endl;
    }

    void displayAll() {
        for (auto& b : books) {
            b.display();
        }
    }
};

int main() {
    Library lib;
    int choice;

    do {
        cout << "\n--- Library Management System ---\n";
        cout << "1. Add Book\n";
        cout << "2. Issue Book\n";
        cout << "3. Return Book\n";
        cout << "4. Search Book\n";
        cout << "5. Show Statistics\n";
        cout << "6. Display All Books\n";
        cout << "0. Exit\n";
        cout << "Enter your choice: ";
        cin >> choice;

        switch (choice) {
            case 1: lib.addBook(); break;
            case 2: lib.issueBook(); break;
            case 3: lib.returnBook(); break;
            case 4: lib.searchBook(); break;
            case 5: lib.showStatistics(); break;
            case 6: lib.displayAll(); break;
            case 0: cout << "Exiting...\n"; break;
            default: cout << "Invalid choice!\n";
        }
    } while (choice != 0);
```

```
    return 0;
}
```