C++ Programming

Practice: Rewriting Library System

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Practice: Rewriting Library System

```cpp
struct user {
    int id;
    string name;
    int borrowed_books_ids[MAX_BOOKS];
    int len;

    user() {

    void read() {

    void borrow(int book_id) {
    void return_copy(int book_id) {
        bool removed = false;
        for (int i = 0; i < len; ++i) {
            if (borrowed_books_ids[i] == book_id) {
                // Let's shift the array to the right to remove this entry
                for (int j = i + 1; j < len; ++j)
                    borrowed_books_ids[j - 1] = borrowed_books_ids[j];
                removed = true;
                --len;
                break;
            }
        }
        if (!removed)
            cout << "User " << name << " never borrowed book id " << book_id
                    << "\n";
    }

    bool is_borrowed(int book_id) {
        for (int i = 0; i < len; ++i) {
            if (book_id == borrowed_books_ids[i])
                return true;
        }
        return false;
    }
```

Practice: Rewriting Library System

```cpp
struct user {
    int id;
    string name;

    // set will allow remove & sort easily
    set<int> borrowed_books_ids;

    user() {
        name = "";
        id = -1;
    }

    void read() {
        cout << "Enter user name & national id: ";
        cin >> name >> id;
    }

    void borrow(int book_id) {
        borrowed_books_ids.insert(book_id);
    }
```

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```cpp
void return_copy(int book_id) {
    auto it = borrowed_books_ids.find(book_id);

    if (it != borrowed_books_ids.end())
        borrowed_books_ids.erase(it);
    else
        cout << "User " << name << " never borrowed book id " << book_id
                << "\n";
}

bool is_borrowed(int book_id) {
    auto it = borrowed_books_ids.find(book_id);
    return it != borrowed_books_ids.end();
}

void print() {
    cout << "user " << name << " id " << id << " borrowed books ids: ";
    for (int book_id : borrowed_books_ids)
        cout << book_id << " ";
    cout << "\n";
}
```

Practice: Rewriting Library System

```cpp
struct library_system {
    vector<book> books;
    vector<user> users;
```

```cpp
void print_library_by_name() {
    sort(books.begin(), books.end(), cmp_book_by_name);

    cout << "\n";
    for (book &b : books)
        b.print();
}

void print_users() {
    cout << "\n";
    for (user &u : users)
        u.print();
}
```

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."