Lab 2 - Library Management using Inheritance

logic of the app:

Requirement 1:

Base on the requirements, there are two roles in this system: Librarian and Customers, both of them are users, so I create a class: User for their common properties: ID, Name,LoginDate.

Other than common properties, they each have their own properties. For customers a method of membershipLevel is needed, for librarians, Update membershipLevel is needed. The relationship shows by following graphic:

Class: User

ID

Name

LoginDate



Class:Customers : User

CheckMembershipLevel

Class:Librarians : User

UpdateMemberShipLevel

Requirement 2:

I will create a common class: Book with properties of title, author,publicationYear, isBorrowed, and a class FictionBook with special property: genre (e.g., mystery, romance, science fiction), and a class NonFictionBook with special property: subjectArea (history, science). The relationship shows by following graphic:

Class: Book

Title

Author

publicationYear

IsAvailabe

overrideToString



Class: FictionBook

Genre

Override ToString

Class: NonFictionBook

SubjectArea

Override ToString



Requirement 3 And Requirement 4 can be merge to aninterface for actions:

I create a class: BookManage, it must implement method: ListAllBook, AddABook, RemoveAbook, and IsBorrowable , will inherit from Abstract class of IBookManage.

Class: IManage

ListAllBook

AddABook

RemoveAbook

IsBorrowable

BorrowABook

ReturnABook

IsManageable



Class: BookManage

The entire logic of Lab2:

Becase of the lab is focused on inherit, I initialized a librarian and a customer and some books in the system to avoid need to create users and add books in the system for testing this system.

Show a menu for operation in main entrace

1. Login to the system as a librarian
2. Login to the system as a customer
3. Exit

After login to the system, show different menu

Librarian:

List All books

Add a book

Remove a book

Update membership

Exit

Customer:

List all books

Bowrrow A book

Returen A book

Exit

All funcations will be implemented in a void and be derived in void main.