Grant Nakashima

CS 161

Final Project

Understanding

This week's focus was to utilize everything we learned this quarter. We had to make a library simulator that uses three classes: book, patron and library. Using the .h files provided to us, we had to create the cpp files. We had to uses classes, pointers, loops, constants, strings, nested loops, and vectors. We also had to use Enums.

Design

1) In Book.cpp
    a. Make constructors
    b. In default constructor, set variables to either null, 0 or on shelf.
    c. For the get functions, return the variable
    d. For the set functions, pass the appropriate variable and set the variable to the passed variable.
2) In Patron.cpp
    a. Make constructors
    b. In default constructor, set fine amount to 0 and set checked out books vector to 100.
    c. For the get functions, return variable
    d. For most of the set functions, pass the appropriate variable and set the variable to the passed variable.
    e. For the addBook function, push back the book.
    f. removeBook function, make a for loop
        i. make if statement comparing book's idCode
        ii. erase book from vector
    g. amendFine function
        i. make it the fine amount += amount (Passed variable)
3) In Library.cpp
4) Make constructor and mutater prototypes
    a. Set holdings to 100
    b. Set members to 100
    c. Set current date to 0
5) addBook function
    a. get id code, title and author
    b. make for loop
        i. make if statement to see if id has been used
    c. push book into holding
6) addMember function
    a. get id number, and name

i. make for loop and if statement to check if id has been used
ii. push patron into member

7) checkoutbook function
    a. find specified patron
        i. make object
        ii. make for loop and if statement to patronID
            1. set loop number to x
    b. make bool that will be used to determine if in library
        i. make for loop
        ii. make if statement comparing id
        iii. if it the correct id, set bool to true
        iv. repeat for member id
    c. check if book has been checked out
        i. make for loop
        ii. make if statement.
        iii. See if holding location is checked out
        iv. Make if statement to on hold and request by specified member
    d. Update book
        i. Make for loop and if statement to idcode and on shelf
        ii. Set checked out, date checked out and location
    e. Update requested
        i. make for loop and if statements. One if statement to book id and one to location and requested person
        ii. set requested to null
    f. add book into members list
        i. make for loop and if statement
        ii. add to member
        iii. print who it was checked out by
8) returnbook function
    a. check if book and member in system
        i. same as above
    b. check if book checked out
        i. print not checked out
    c. make for loop to remove book
        i. make for loop
        ii. make if statements: idcode, checked out and if it not null
            1. set location to hold
            2. set checked out to current date
            3. else statement
                a. set location to shelf
                b. set date to current date
        iii. remove book and print what book was returned
9) requestBook
    a. check if patronId and book valid. Same method as above

    b. make if statements
        i. book pointer to requested by equal to NULL
        ii. one to location equal to on shelf
            1. set location to on hold
            2. set request to patron
            3. print
        iii. else if for location equal to checked out
            1. set requested to patron
            2. print

10) incrementCurrentDate
    a. currentDate++
    b. make for loop
    c. if statement
        i. set second for loop to size of checked out books
        ii. if set to only add fine if over due

11) payFine
    a. check if patronID valid. Same method as above
    b. make payment negative

12) viewPatronInfo
    a. check if patronID valid. Same method as above
    b. make patron object
    c. print out required information
    d. print checked out books
        i. make for loop and if statements
        ii. one to patron and one to checked out
        iii. print

13) viewBookInfo
    a. check if book code is valid
    b. make for loop and if statement to book id
    c. print information
    d. make if else statement for location
    e. make specific numbers equal to either on shelf, on hold or checked out
    f. make loop for requested book
        i. if requested !- null, print out who requested book
    g. make loop for who checked out book
    h. print out name and due date

14) menu.cpp
    a. make menu input validator function
        i. make while loop
        ii. get input
        iii. make for loop
        iv. check for letters
        v. make if statement
        vi. make string into int

b. make library object
c. make while loop
d. design menu
e. make switch
f. make each case according to menu design

Testing

Prompt	Input	Expected Output	Actual output
Add member	123(id), grant(name)	Valid input so for it to get set to vector	Valid input so for it to get set to vector
Add book	123(id), trains(title), grant(author)	Valid input so for it to get set to vector	Valid input so for it to get set to vector
same member	123	That id is currently being used	That id is currently being used
Same book	123	That id is currently being used	That id is currently being used
To quit	10	quit	quit
Invalid menu input	Y	Invalid input	Invalid input
Number larger than 10	11	Please use a number between 1 and 10	Please use a number between 1 and 10
checkOutBook	123 123	Trains was checked out by grant	Trains was checked out by grant
Checkout book invalid	123 321	That person is not a member of this library	That person is not a member of this library
Checkout book already checked out	123 123	That book has been checked out	That book has been checked out
Check out book that is on hold	123 123	That book is on hold at the moment	That book is on hold at the moment
Return book invalid book	321 123	That book is not in the library	That book is not in the library
Return a book that isn't checked out	123 123	That book is not checked out	That book is not checked out
Return book	123 123	Trains has been returned	Trains has been returned
Request book	123 123	Grant has been put on the wait list for trains	Grant has been put on the wait list for trains
Request book that is already on hold	123 123	This book has been requested by someone already	This book has been requested by someone already
Request invalid book	321 123	That book is not in the library	That book is not in the library
Increment date	n/a	n/a	n/a
Payfine	50	Accumulated fine down	Accumulated fine down
View patron	123	Prints information	Prints information
View books	123	Prints info on book	Prints info on book

Reflection

The most difficult part of this week's assignment was using pointers. One example was with the incrementCurrentDate function. It took me a while to figure out how to get the specific member and books to point to the correct date. When I first wrote my code, it would increment for every member instead of the specified user. After I rewrote my code, I wasn't working because I forgot to add on the () at the end of the function. The other problem I had was with the request function code. At first, I tried to get it to work without using pointers but I soon realized it would be easier to use pointers. The next problem that occurred was the book's location wouldn't change to NULL once the book would be checked out. I found out that I had left out one condition where the request is equal to the patron into my code. Once I added that, it solved my problem.