



Homework 2 (UPDATED)

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CSCE1040 – Design System



Class Name, With Attributes

Book

Author (string)
Title (string)
Description (string)
ISBN Number (long)
Library ID Number (string)
Cost (double)
Current Status (Vector)
-Now a char variable
Set/Get Author
Set/Get Title
Set/Get ISBN Number
Set/Get Library ID Number

Patron

Name (string)
DOB (string) (not implementing)
ID Number (long)
Fine Balance (double)
Current # of Books Out (int)
Set/Get Name
Set/Get ID Number
Set/Get Fine Balance
Set/Get Current # of Books
Set/Get DOB

Loan

Loan ID (int)
Book ID (string)
Patron ID (int)
Due Date and Time (string)
Will make it using time
Current Status (vector)
- Now a char variable
Set/Get Loan ID
Set/Get Book ID
Set/Get Due Date
Set/Get Time Due
Set/Get Current Status

Class Methods

Books

Add Book
Edit Book (Update Book Info)
Delete Book
Search/Find Book
Print Books (Based on entry from Search/Find)
- Using find function for search and find
Print details for a single Book
Print List (entries in the collection)

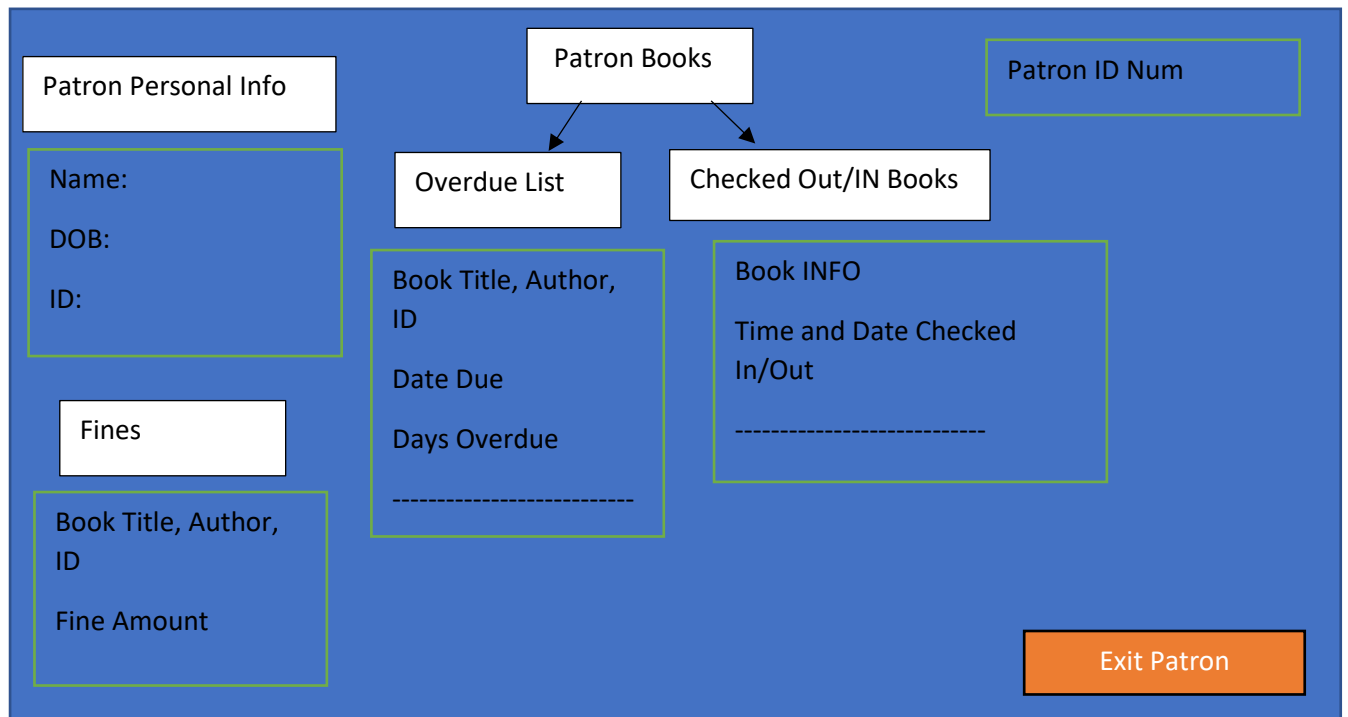
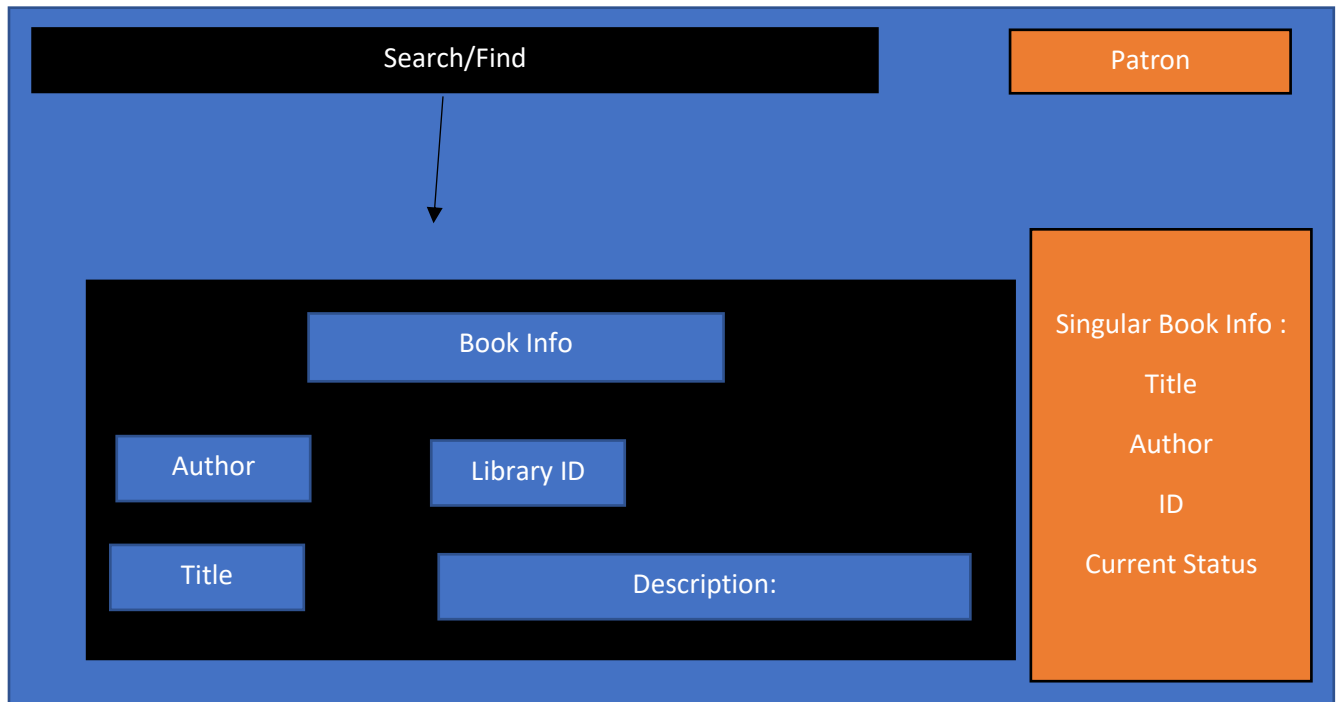
Patrons

Add Patron
Edit Patron
Delete Patron
Search/Find Patron
Print details of Patron
Print details of Books Patron currently has
PayFines

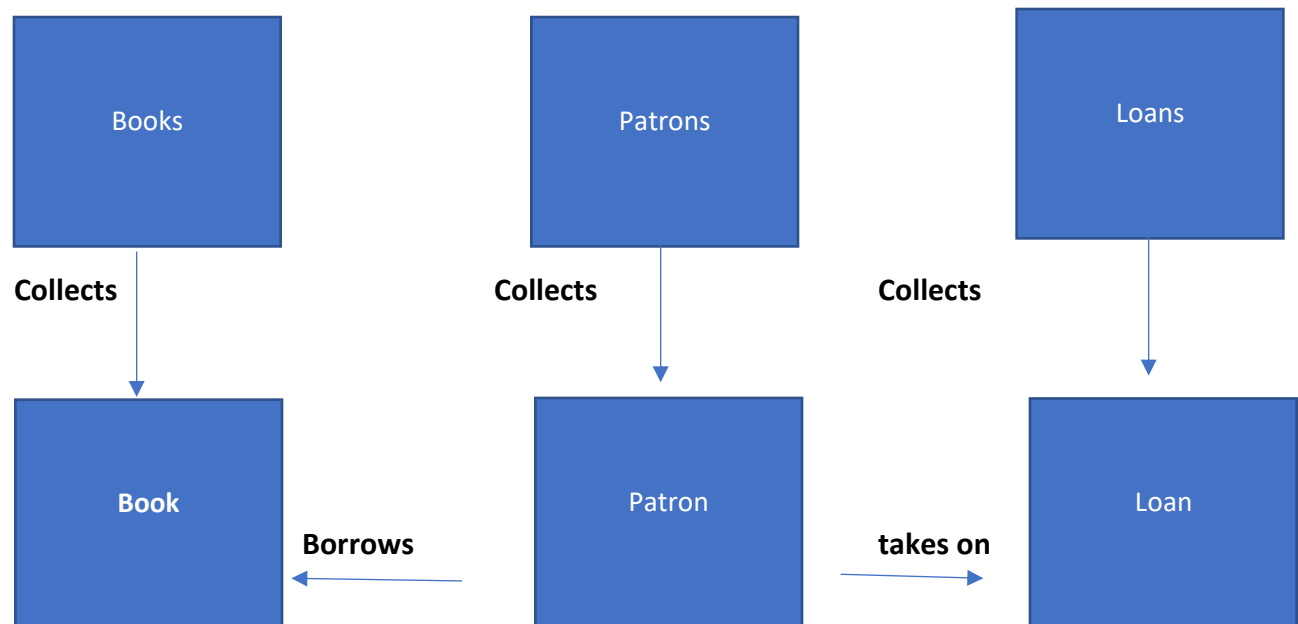
Loans

Check Out Book
Check in a Book
List all Overdue Books
Books a Patron Has
Update Patron Loan Status
Re-check Out a Book
Edit Patron Loan (Add, Delete, Edit)
Report lost Book
Print List Overdue Books

Menu System:



Class relationships:



Pseudocode For All Methods:

Methods For Books:

Add Book:

Prompt user for the following:

- Author name
- Title of Book

Get/Create ISBN Number

Get/Create Library ID Number

Get/Create Book Description

Get/Create Cost of Book

Create A Book Object

Add book object to Collection

Edit Book:

Prompt user for the following:

Modify Book Title

Modify Book Author

Modify Book ISBN Num associated with the title/Author

Modify Book Library ID Number associated with title/Author

Edit book object status

Add modified book object to collection

Delete Book:

Prompt user for the following:

Original Book name

Remove Book from collection using a loop and erase operator

Search/Find Book:

Prompt user for the following:

*Note: Will only need 2/3 info to be able to search

Book Name

Book Author

Book Library ID Number

Begin scan info

Print Books:

Print searched list of books based on:

- Author, Name, Library ID Searched

Print Details for A Single Book:

Get Author name, Title, Description, Library ID for Book

If Info matches a book object, print to screen

Print List (entries in collection):

Get all Book objects info: Author name, title, description, ISBN, Library ID

Organize them in a loop to print info based on the number of books in collection

Format output to be able to distinguish each book object and its info

Print all entries.

Methods for Patrons

Add Patron:

Prompt user for the following:

- Name
- DOB

Generate a random 6-digit ID number using time and a for loop

Store ID number, Name, and DOB with associated Patron Object

Add patron to collections

Delete Patron:

Prompt user for the following:

- Name
- DOB
- 6-digit ID Number

Remove from the collections using a loop and erase operator

Modify Patron:

Prompt user for the following:

- Name
- DOB
- 6-Digit ID Number

Create a new patron and allow user to add new values

Set new patron object equal to old one

Remove old patron object

Add modified object to the collection

Search/Find Patron:

Prompt user for the following:

- 6 – digit ID Number

Scan for exact 6-digit number (will only need ID because ID number is not the same or like any other patron ID number). – Using scanf

If ID number is found print, if not, print error to screen

Print to screen Patron Info associated with ID (name, and DOB)

Print Info of Patron:

Scan patron 6-digit ID, Name, DOB - using scanf

If found, Print patron info

Print info of Book Patron Has:

Scan info of checked out books under specific patron with the following:

- Title
- Author Name
- Book Description

associated with Library ID and ISBN

Print checked out books

PayFines:

If a patron has checked out a book for more than 10 days, if yes

Check if the patron has rechecked the book once, AND, it has been more than 10 days (rechecked out)

If yes, add \$0.25 amount to PayFines

Add to Patron info

Check every 24 hours if book is checked out, add charge to previous charge by using a loop

Methods for Loans

Check out a book:

Add book to specific patron account

Update book status

Set check-out time limit (10days) to patron account

Update book collections

Check out a book:

First, if check for fines in PayFines of patron, if there are fines, decline book check out

If not continue:

Check if Patron has at most 6 books checked out, if so decline book check out, if not continue

Add book to specific patron account

Update book status as out

Set check-out time limit (10 days) to patron account

Add loan

Update Patron Info

Update book collections

Check in a book:

First, if check for fines if there is a fine request for user to pay Fine,

Update PayFines method within Patron info

Update book status at in

Delete loan from patron account

Update Patron info

Update book collections

Update Loan Status Based on System clock:

If patron has checked out a book for more than 10 days (checking date and time)

Charge patron 0.25

Put this in a loop and check it every 24 hours, if patron still has the same book checked out after another 24 hours

Add 0.25 to their previous charge

If patron returns book AND pays fine

Delete fine from Patron account

Update Patron account

List all Overdue:

Create an Overdue List Section on Patron account

If patron has checked out a book for more than 10 days

Add to Overdue List

If all books are checked for IF OVERDUE,

Print list of overdue books along with Patron Info

List all Books Patron has:

Check loans in patron account (that are currently checked out)

Print list of books Patron has checked out

Re-Check out a book:

Check if patron has book

If patron has book, and wants to recheck out

Update books check out time in loans for additional 10 days

Delete 1 recheck out pass in patron account

Update loans

Edit a loan:

Check patron account for any checkout books

If book checked out, add to loans

If not, delete from loans

Update Loans

Report Lost:

If patron files for missing book

Update collections info of missing book

Add cost of book to PayFines for patron

Add book back to collections

Update collections

My Design Experience:

I enjoyed this design experience. Usually when I am faced with a coding assignment, I tend to overthink and stress myself out because although I may know how to code a problem, when the problem becomes too complex, my mind focuses on so many solutions at one time, it is hard to tell where to start. This design assignment allowed me to think about one method and one class at a time, and how they connect with each other, without worrying about whether it'll compile first.

This assignment did take me about 2 and half hours to complete, at the beginning was overthinking the assignment because I wondered how exactly I create a design system for the classes and methods provided, but once I started, I started to get into the groove of the assignment. I did start this assignment Monday, (two days before the due date). After lecture explanation. I found this assignment to be easy but at the same time difficult because I never had experience with creating a design system versus just coding. I learned that it is best to spend time reviewing a project resources and tips before starting. I lightly reviewed but was still confused to begin, until after lecture where my confusion cleared up. I had trouble with the "BOOK" portion of the assignment, because I was thinking how we're supposed to edit information for the Book based on whose perspective. Library workers? Customers/Patrons? The Library System?

This design experience teaches me to practice pseudocode and designing a solution to my problems before jumping into coding so I would at least have an idea of the steps I need to take to accomplish each and individual task.

I hope to have more opportunities in the future to create another design project, but also implement this concept and practice into my day-to-day coding assignments and future projects as well.

