Kelly Zhou

CSCE 1040.001

Homework 2

Class Relationships

Patrons	**Books**	**Loans**
↑ Collects	↑ Collects	↑ Collects
Patron —Borrows→	**Book** —Creates→	**Loan**
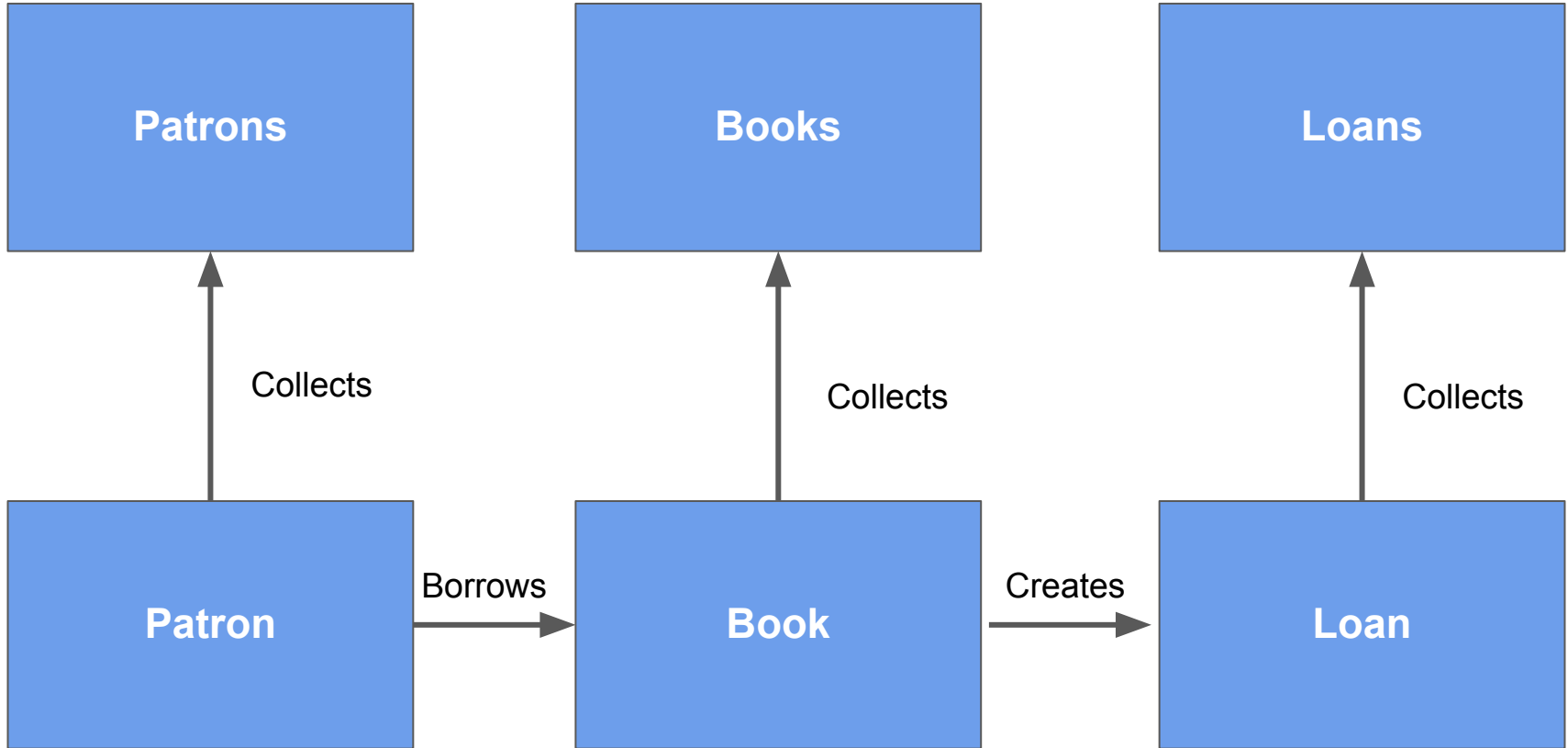
Class Contents

Patron

Name (string)

ID number (int)

Fine Balance (double)

Current # of books out (int)

Set/Get Name

Set/Get ID number

Set/Get Fine Balance

Set/Get Current # of Books
Out

Book

Author (string)

Title (string)

ISBN Number (string)

Library ID Number (double)

Cost (double)

Current Status (string)

Set/Get Author

Set/Get Title

Set/Get ISBN Number

Loan

Loan ID (int)

Book ID (int)

Patron ID (int)

Due Date and Time (string)

Current Status (string)

Set/Get Loan ID

Set/Get Book ID

Set/Get Patron ID

Set/Get Due Date and Time

Class Contents (Cont.)

Patron	Book	Loan
Add Patron	Set/Get Library ID Number	Set/Get Current Status
Edit Patron	Set/Get Cost	Check out a book
Delete Patron	Set/Get Current Status	Check in a book
Search/Find	Add Book	List all overdue
Print Patrons	Edit Book	List all books for a particular patron
Print Patron	Delete Book	Update loan status based on system clock
No Overdue	Search/Find	Re-check a book
Pay Fines	Print Books	Edit a loan
	Print Book	Report Lost

Pseudocode - Patron Methods

Add Patron

Prompt user for name
Prompt user for ID number
Assign fine balance and current # of books
out to zero
Create Patron Object
Populate Object
Add Object to patron vector

Delete Patron

Prompt user for name
Loop through patrons vector to find index of the
name
If the index is found, remove the element from
the vector
If the index is not found, print a statement
telling the user that the name was not found.

Print Patron

Prompt user for name
Loop through patrons vector to find index of
the name
If the index is found, print patron information
If the index is not found, print a statement
telling the user that the name was not found.

Edit Patron

Prompt user for name
Prompt user for fine balance
Prompt user for number of books out
Loop through patrons vector to find index of
the name
If the index is found, check to see if the
patron's fine balance and number of books
out matches the ones entered by the user.
If they don't replace the current values with
the ones prompted by the user.
If the index is not found, print a statement
telling the user that the name was not found.

No Overdue

Prompt user for name
Loop through patrons vector to find index of
the name
If the index is found, check to see the
number of books the patron has checked out.
If the number is less than 7, return true.
If the number is more than 6, return false.
If the index is not found, print a statement
telling the user that the name was not found.

Search/Find Patron

Prompt user for name
Loop through the patrons vector to find the
index of name.
If the index is found, return the index
number.
If the index is not found, print a statement
telling the user that the name was not found.

Print Patrons

Loop through the patrons vector
At each index, print out the information for
the patron stored at that index.

Pay Fines

Prompt user for name.
Loop through the patrons vector to find the
index of the name entered by the user.
If the index is found, return the fine balance.
If the index is not found, print a statement
telling the user that the name was not found.

Pseudocode - Book Methods

Add Book

Prompt user for author name
Prompt user for book title
Prompt user for book ISBN Number
Prompt user for library ID number
Prompt user for book cost
Prompt user for current status of book
Create Book Object
Populate Object
Add Object to book vector

Delete Book

Prompt user for title
Loop through vector to find index of the title
If the index is found, remove the element from the vector
If the index is not found, print a statement telling the user that the title was not found.

Print Book

Prompt user for title
Loop through vector to find index of the title
If the index is found, print book information
If the index is not found, print a statement telling the user that the title was not found.

Edit Book

Prompt user for title
Prompt user for current status
Loop through vector to find index of the title
If the index is found, check to see if the book's current status matches the status entered by the user.
If it doesn't match, replace the current values with the one prompted by the user.
If the index is not found, print a statement telling the user that the name was not found.

Search/Find Book

Prompt user for title
Loop through the vector to find the index of title.
If the index is found, return the index number.
If the index is not found, print a statement telling the user that the title was not found.

Print Books

Loop through the vector
At each index, print out the information for the book stored at that index.

Pseudocode - Loan Methods

Check out a book
Prompt user for book ID.
Prompt user for patron ID.
Loop through the books vector to find the index of title.
If the index is found, check the current status to see if it's in.
If it's in, loop through the patrons vector to find the index of patron ID.
If index is found, call the get # of books out function.
If the function returns a number less than 7, create a loans object and populate it with the information received from the user. Additionally, change the current status (book object) to out and increase the number of books out (patron object) by 1.

Re-check a book
Prompt the user for book ID.
Loop through the vector to find index of book ID.
If the index is found, add 10 days to the due date and time.
If the index is not found, print a statement telling the user that the book ID was not found.

Update loan status based on system clock
Loop through loan vector.
At each index, check the due date and time.
If the due date and time already passed, but the current status is normal, change the current status to overdue.

List all books for a particular patron
Prompt user for patron ID
Loop through loan vector.
At each index, check if the patron ID of the loan matches the patron ID entered by the user.
If they match, print out the book ID.

Edit a loan
Prompt user for loan ID
Prompt user for due date and time
Prompt user for current status.
Loop through loan vector to find the index of loan ID.
If load ID is found, check if the due date and time and current status match that entered by the user.
If they don't match, change the values so that they do match.

Check in a book
Prompt user for book ID.
Prompt user for patron ID.
Loop through the loans vector to find the index of book ID.
If the index is found, check to see if there are any fines.
If there are fines, loop through the patrons vector to find the index of the patron ID.
If the patron ID is found, add the fine amount to the fine balance.
Loop through the books vector to find the index of book ID.
If the index is found, change current status to in.
Delete the object from the loans vector.

List all overdue
Loop through loan vector.
At each index, check the current status.
If the current status is overdue, print out the loan information.

Report Lost
Prompt user for title.
Prompt user for patron ID
Loop through book vector to find the index of title.
If index is found, change current status to lost.
Loop through patrons vector to find patron ID and add cost of book to fine balance.

Design Experience

Overall, I didn't really enjoy the design experience and would much rather have coded. In my opinion, the instructions and criteria weren't as clear as they could've been. Thus, it was difficult trying to complete the project since I didn't know exactly what was expected. However, I can see how this project could have helped students who were struggling to understand the concept of classes, so it may have been useful for some students. To conclude, I personally would've much more rather had a coding project, but I can see how some students might've found this project helpful.