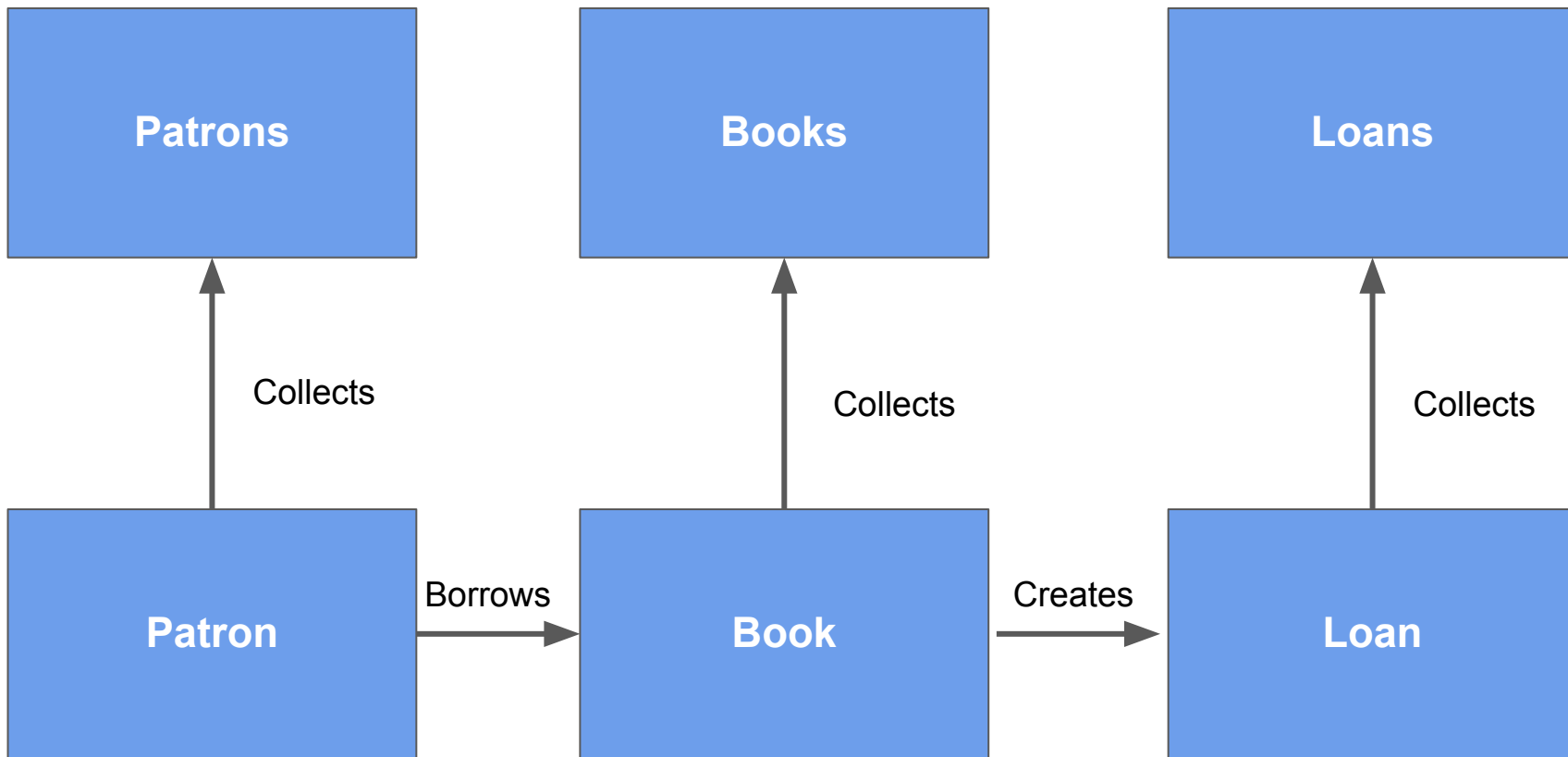


**Kelly Zhou**

**CSCE 1040.001**

**Homework 3**

## Class Relationships



## 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

### Book

Set/Get IDnum

Set/Get cost

### Loan

Set/Get currStatus

Set/Get fine

## Class Contents (Cont.)

### Patrons

patronVec (vector)

Add Patron

Edit Patron

Delete Patron

Find Patron

Print Patrons

Print Patron

Pay Fines

Load Patrons

Store Patrons

### Books

bookVec (vector)

Add Book

Edit Book

Delete Book

Find Book

Print Books

Print Book

Load Books

Store Books

### Loans

loanVec (vector)

Checkout

Checkin

Print Overdue

Print Patron

Update Status

Recheck

Edit Loan

Report Lost

Load Loans

Store Loans

## Class Contents (Cont.)

### Patrons

FindPatronID

FindBooksOut

EditPatron2

Clear

### Books

FindBookID

FindCost

EditBook2

Clear

### Loans

CountOverdue

EditLoan2

NoOverdue

Clear

## Pseudocode - Patrons Methods

### Add Patron

- Take the values in the method parameter to create a new Patron object
- add that object to the patron vector

### Delete Patron

- loop through the patrons vector to find the index of name
- if the index is found, remove the patron from the vector
- if the index is not found, print a statement telling the user that the name was not found

### Edit Patron

- if the action is 'o', increase the patron's booksOut variable by 1
- if the action is 'i', decrease the patron's booksOut variable by 1
- if the action is 'r', increase the patron's fine balance by fine

### Pay Fines

- 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.

### Print Patron

- Loop through patrons vector to find index of the name
- If the index is found, print patron information

### Find Patron

- 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, return -1

### Print Patrons

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

### Load Patrons

- read in data from the Patrons.dat file
- assign those values to a new Patron object
- push the Patron object to the patrons vector

### Store Patrons

- loop through the patrons vector
- write out the patron information out onto the Patrons.dat file

### FindPatronID

- find the id of the patron based on the patron index

### FindBooksOut

- find the number of books that the patron has checked out based on the patron index

### EditPatron2

- Loop through patrons vector to find index of the patron ID
- If the index is found, update the fine balance

### Clear

- clear the patrons vector

## Pseudocode - Books Methods

### Add Book

- Take the values in the method parameter to create a new Book object
- add that object to the book vector

### Delete Book

- loop through the book vector to find the index of title
- if the index is found, remove the book from the vector
- if the index is not found, print a statement telling the user that the title was not found

### Find Book

- Loop through the book vector to find the index of title.
- If the index is found, return the index number.
- If the index is not found, return -1

### Print Book

- Loop through book vector to find index of the book title
- If the index is found, print book information

### Edit Book

- if the action is 'o', set the book's current status to "out"
- if the action is 'i', set the book's current status to "in"
- if the action is 'r', set the book's current status to "return"
- if the action is 'l', set the book's current status to "lost"

### Print Books

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

### Load Books

- read in data from the Books.dat file
- assign those values to a new Book object
- push the Book object to the books vector

### Store Books

- loop through the books vector
- write out the loan information out onto the Books.dat file

### FindBookID

- find the id of the book based on the book index

### FindCost

- find the cost of the book based on the book index

### EditBook2

- Loop through books vector to find index of the book ID
- If the index is found, update the current status

### Clear

- clear the loan vector



# Pseudocode - Loan Methods

## Check out a book

- find the index of book with the FindBook method
- change the book's current status to out
- find the book's ID with the FindBookID method
- find the index of patron with the FindPatron method
- find the patron's ID with the FindPatronID method
- use the time library to generate the due date for the book
- create a loan object with the information
- add the object to the loan vector

## Check in a book

- find the index of the book with the FindBook method
- change the book's current status to in
- find the index of patron with the FindPatron method
- loop through the loan vector to find the index of the loan being checked in
- use the time function to see if the book is overdue
- if it's overdue, multiply the days that it's overdue by 0.25
- add the find to patron

## 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.

## List all books for a particular patron

- Loop through loan vector to find the index of the patron
- print out the information for each book that the patron has checked out

## Edit a loan

- loop through the loan vector to find the index of loan ID
- if the current status of the book doesn't match what is currently stored, update the value

## Re-check a book

- loop through the loan vector to find the index of book ID
- use the time library to add 10 days to the current date
- update the value of the old due date

## Clear

- clear the loan vector

## Report Lost

- find the index of the book with the FindBook method
- update the status of book to lost
- find the index of the patron with the FindPatron method
- find the cost of the book with the FindCost function
- update the fine balance and number of books out of the patron
- delete the loan

## No Overdue

- find the index of the patron based on patron name
- find the number of books out for the patron
- if there are more than 6 books out, return true
- else, return false

## Count Overdue

- Loop through loans vector to find the loans belonging to a certain patron
- check to see if the loan's status is overdue
- Ireturn the number of overdue loans

## Edit Loan 2

- Loop through patrons vector to find index of the patron ID
- If the index is found, update the current status

## Pseudocode - Loan Methods (cont.)

### Load Loans

- read in data from the Loans.dat file
- assign those values to a new Loan object
- push the Loan object to the loans vector

### Store Loans

- loop through the loans vector
- write out the loan information out onto the Loans.dat file

## **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.