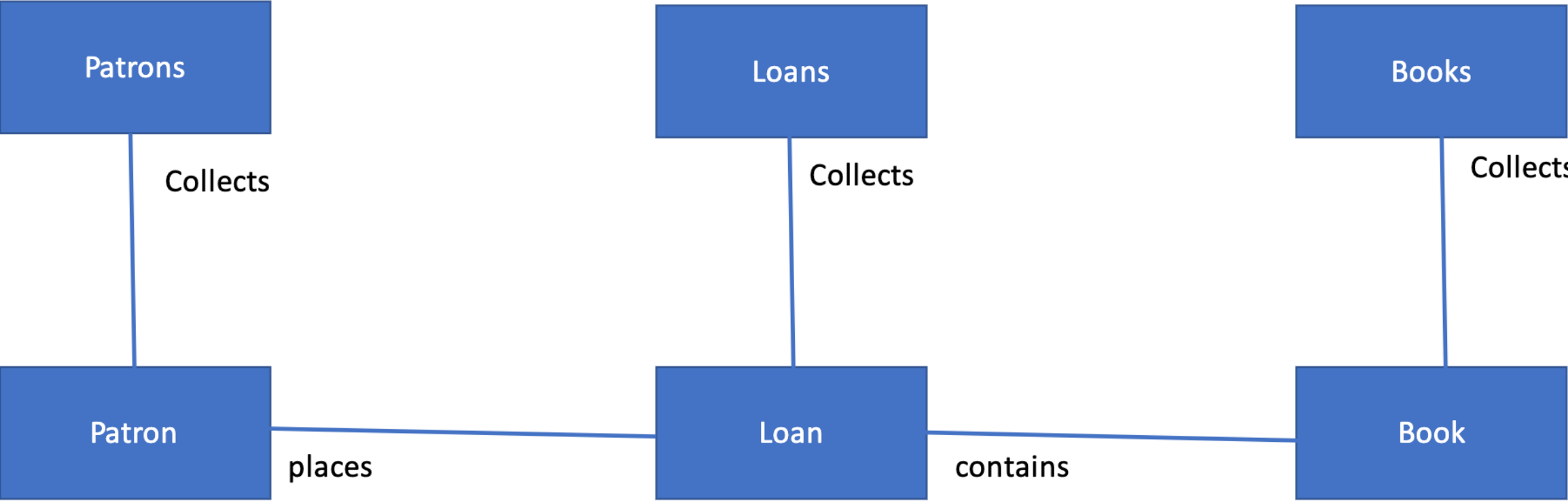# Paarth Jamdagneya
CSCE 1040.001
Homework 2
Library Loan Manager

Class Relationships

Class Contents

Book

Author (string)
Title (string)
ISBN Number (int)
Library ID number (int)
Cost (float)
Current Status (string)
Get/set Author
Get/set Title
Get/set ISBN
Get/set Library ID
Get/set cost
Get/set Current Status

Patron

Name (string)
ID number (int)
Fine Balance (float)
Current # of books out (int)
Get/set Name
Get/set ID Number
Get/set fine balance
Get/set Current # of books out

Loan

Loan ID (int)
Book ID (int)
Patron ID (int)
Patron (patron)
Book (book)
Due Date and Time (string)
Current Status (string)
Get/set Loan ID
Get/set Book ID
Get/set Patron ID
Get/Set Due Date and Time
Get/Set Current Status

Class Contents

Books

BookList (vector)
BookSearch (vector)
Add book
Edit book
Delete book
Search/Find book
Print a list of entries of the book
Print the details for a single entity book

Patrons

PatronList(vector)
PatronSearch(vector)
Add patron
Edit patron
Delete patron
Search/find patron
Print a list of entries of the patron
Print the details for a single entity patron
PayFines

Loans

LoanList (vector)
Check out a book
Check in a book
List all overdue
List all books for a particular patron
Update loan status based on system clock
Re-check a book
Edit a Loan
Report lost

Function Pseudo Code

Add Book

Prompt user for author

Prompt user for title

Prompt user for ISBN number

Prompt user for Library ID number

Prompt user for Cost

Prompt user for current status

Create book object

Populate Object

Add object to books vector

Edit Book

Prompt user for Library ID number

Loop through the book vector until the book is found

Prompt the user for the new ISBN number

Prompt user for new Library title

Prompt user for new cost

Prompt user for new status

Edit book object

Delete Book

Prompt user for library ID number

Loop through the book vector until the book found

Erase the book element from books vector

Function Pseudo Code

Search/Find Book

Prompt user for Library ID

Search vector for specific book

Place the element in a new BookSearch vector

Print a list of entries Book

Loop through the bookList vector and output every element

Print the details for a single entity Book

Prompt the user for the library ID

Search the bookList vector for the specific element using find function (libraryID)

If found then output the last element of the BookSearch vector for all values of that object

Function Pseudo Code

Add Patron

Prompt user for patron name

Prompt user for patron ID

Prompt user for patron balance

Prompt user for number of books checked out

Prompt user for Cost

Prompt user for current status

Create patron object

Populate object

Add patron to patrons vector

Edit Patron

Prompt user for patron ID

Loop through the patronList vector until the patron ID matches one of the elements.

If found prompt the user for the values specified in add patron (except for patron ID)

Update the object

Delete Patron

Prompt user for patron ID

Loop through the patronList vector until the patron ID matches one of the elements.

Get the number of times the loop ran and then erase that ith element of the vector

Function Pseudo Code

Search/Find Patron

Prompt user for patron ID

Search patron List vector for specific patron

Place the element in a new PatronSearch vector

Print a list of entries Patron

Loop through the patronList vector and output every element

Print the details for a single entity Patron

Prompt the user for the patron ID

Search the PatronList vector for the specific element using find function (patronID)

If found then output the last element of the PatronSearch vector for all values of that object

Pay Fines

Prompt the user for the patron ID

Search the PatronList vector for the specific element using find function (patronID)

If found then output the last element of the PatronSearch vector for all values of that object

Function Pseudo Code

Check Out a Book (Loans)

Prompt user for book object

Prompt user for patron object

Set due date from system date + 10 days

Set loan status to normal

Find function to see the patron

Check the number of books patron currently has checked out (if number out is less than or equal to 5)

Check in LoanList vector to see if the specific patron (loop through and match patron ID) has any books with status of overdue

If previous two conditions are false:

Use edit book function to change the status of the book

Use edit patron function to edit the number of books out

Create loan object

Populate Object

Add transaction to loanlist vector

Check in a book (Loans)

Prompt user for loan ID

Search LoanList vector for the transaction

Search patronList vector for specific patron

Check if patron has any fines due

Delete object from LoanList vector

List all overdue (Loans)

Loop through LoanList vector and check if any objects have current status equal to "overdue" and output those objects

Function Pseudo Code

List all books for a particular patron (Loans)

Prompt user for patron ID

Loop through the LoanList and search for any loans which have the same patron ID as input

If match is found then output the book ID listed under Loan object

Continue looping through LoanList until the end of the vector

Update loan status based on system clock (Loans)

Loop through the LoanList vector and check the due date and time listed under the loan object

If current system clock date and time is greater than the time listed under the loan object then change the loan object status to overdue

Get current date and subtract from due date

If date difference is positive then multiply difference by 0.25

Update fine balance of patron associated with the transaction

Re-Check a book (Loans)

Prompt user for loan ID

Loop through the LoanList vector and find the corresponding element

Set new due date to +10 days to the current due date

Edit a loan (Loans)

Prompt user for loan ID

Prompt user for book object

Prompt user for patron object

Prompt user for due date

Prompt user for current status

Use edit patron function to edit the number of books out

Use edit book function to edit the book status

Update loan object

Report lost (Loans)

Prompt user for loan ID

Loop through loan list and find specific transaction

Update the book object status to "lost"

Get book cost from object

Set the patron balance to add the cost of the book

Menu System

Switch-case which displays the different options for patron, books, and loans.

A – Loans

B – Books

C – Patrons

Under each option will be the different functions specified under each class diagram