Assignment 3 – Book Inventory Linked List

Description:

Expand the inventory program you wrote for assignment 2 to use a linked list instead of an array. Your program should still open a file, read in the information, and store it in your linked list implementation. It should also print this information once the program has finished running. The code we wrote in lecture video cpp_2 should be used as a basis for this assignment.

Your program should read each book from the file, store the information in the associated class Objects (book in Book, date in Date, etc.), create a new Node to store that information, and then add the new Node to a linked list. Once your program has finished reading the information it should print out the contents of the linked list formatted like the example shown at the end of this file.

The following **classes** should be defined by your program:

```
class Date            : Hold information pertaining to a Date
class Book            : Store information pertaining to a Book
class Node            : Used to construct link list and hold individual
                        books
class LinkedList      : Perform various operations (insert, print, etc.)
                        on the linked list.
```

The following **public** members should be contained within `class Date`:

```
int day;
int month;
int year;
```

The following **public** functions should be defined within `class Date`:

```
Date(void);           : constructor taking no arguments
~Date(void);          : deconstructor taking no arguments
```

The following **public** members should be contained within `class Book`:

```
string _title;
string _author;
Date _published;
string _publisher;
float _price;
string _isbn;
int _page;
```

```
int _copies;
```

The following **public** functions should be defined within `class Book`:

```
Book(void);                : constructor taking no arguments
~Book(void);               : deconstructor taking no
                             arguments
```

The following **private** members should be contained within `class Node`:

```
Book *_book;       : reference to Book structure
Node *_next        : reference to next Node in linked list
```

The following **public** members should be defined within `class Node`:

```
Node(void);                : constructor taking no arguments
Node(Book*);               : constructor taking reference to
                             predefined Book as argument
Node(Book*,Node*); : constructor taking references to a
predefined Book and Node
~Node(void);               : deconstructor taking no arguments
```

The following **private** members should be contained within class `LinkedList`:

```
Node *_head;       : reference to first Node in list
Node *_tail;       : reference to last Node in list
```

The following **public** functions should be defined within class `LinkedList`:

```
LinkedList(void);    : constructor taking no arguments
LinkedList(Book*)    : constructor taking reference to
predefined Book
~LinkedList(void)    : deconstructor taking no arguments
void insert_front(Book*) : insert Book reference into front
of list
void insert_rear(Book*) : insert Book reference into end of
list
void print_list(void) : print the contents of the list
```

** Do not change names, as it will interfere with grading.

Like your other programs, it will need to read information from a file. The file will be structure as follows:

```
Title (string)
Author (string)
```

```
Published (int int int)
Publisher (string)
Price (float)
ISBN (string)
Pages (int)
Copies(int)
```

You may also assume each line ends with a newline ('\n') character. However, there should be no limit (other than memory) to the number of books your program should be capable of handling. Also, stay conscious of the differences between the file structures of Windows and Linux systems and how that may affect your file reads.

Example:

```
$ cat input.txt
Magician: Apprentice
Raymond E. Feist
12 1 1993
Spectra (January 1, 1994)
5.02
0553564943
512
1
Magician: Master
Raymond E. Feist
12 1 1993
Spectra (January 1, 1994)
7.99
0553564935
499
1
$ g++ book_inventory_linked_list.cpp
$ ./a.out
Title:     "Magician: Master"
Author:    Raymond E. Feist
Published: 12/1/1993
Publisher: Spectra (January 1, 1994)
Price:     $7.99
ISBN:      0553564935
Pages:     499
Copies:    1
Title:     "Magician: Apprentice"
Author:    Raymond E. Feist
Published: 12/1/1993
Publisher: Spectra (January 1, 1994)
Price:     $5.02
```

```
ISBN:      0553564943
Pages:     512
Copies:    1
```

Due:

October 9th, 11:59 PM