Assignment 2: Object-Oriented Programming

In this assignment, you'll need to build and run a small Library in Lennoxville. All classes must be created in separate files.

Book (5)

First, start by building a class that describes a Book at a Library. It should have one private instance variable for the title of the book, and one for its availability (borrowed or in stock).

Add methods for setting and getting the availability variable, along with a getter for the title. Consider how these should be named for code clarity. For instance, using a method called `returned()` to return a Book to the Library could be used as a setter for the borrowed field. The same logic could be applied to when it's borrowed:

```
public void borrow() {
	this.borrowed = true;
}
```

Furthermore, the getter for the borrowed variable could be named `isBorrowed` as it is more descriptive about what it answers when compared to `getBorrowed`. Keep this technique in mind for future class designs.

Library (10)

Now we have the inventory designed and ready for building a little Library!

Build a class called Library that contains a book collection and a given address. Given that we'd like to expand our book collection over time, we won't be able to use standard arrays. To have a dynamically-sized, resizable, or growable array, we will make use of the ArrayList class: https://docs.oracle.com/en/java/javase/21/docs/api/java.base/java/util/ArrayList.html

To make a vector for the book collection, you can do the following:

```
ArrayList<Book> bookCollection = new ArrayList<Book>();
bookCollection.add(new Book("The Lord of the Rings"));
```

Now let's get ready for some customers. Ensure that your Library can do the following:

1. Print opening hours for all libraries (they all open and close at the same time 9AM-5PM).
2. Print the address of the library.
3. Add a book to the book collection.
4. Borrow and return books from the book collection.
5. Print all available books.

With all these methods implemented we are ready to open to the public!

Pre-opening Day (5)

You've realized that you should test your implementation before opening it the public! This means you will act as the first customer to the libraries you are building, and perform at least the following in your main method:

1. Enter your libraries (one is at "120 Queen St.", and the other at "228 College St.").
2. In the Library on Queen street, add these four books to the collection:
    a. The DaVinci Code
    b. Le Petit Prince
    c. A Tale of Two Cities
    d. The Lord of The Rings
3. Leave the library on College street empty.
4. Print the opening hours for the libraries, and make sure they all match (i.e. not unique to instances)
5. Do the same for the addresses but this time they shouldn't match.
6. Borrow "The Lord of The Rings" at the library on Queen St., and without returning it, try to borrow it again.
7. Borrow the same book at the library on College St.
8. Print the books you have available at each library.
9. Return the book "The Lord of the Rings".
10. Re-print the books available.

Competition (10)

A competing library opened up next door on the same day as you. The library has all the same features as yours currently has. Implement some feature(s) in your library that will attract more people to yours! It should be created using 2 additional classes.

Grading Criteria:

Style/submission guidelines: https://gmierzwinski.github.io/bishops/cs321/style_guidelines.html

Comments, Formatting, & Readability	**5 Marks**
Submission Guidelines	**5 Marks**
Parts 1-3	**30 Marks** **See (X) above**
Total	**40 Marks**