CSE218 HW1

Note:

Create a Java project called HW 1 in Eclipse for this problem set. Use a separate package for each problem below. You may copy / paste or import classes between packages if necessary. When finished, compress the project into a single .zip file, and then upload it to the dropbox on Brighspace. Due next Thursday before class.

1. Write a **Book** class. The class contains the following instance variables: title (String), isbn (String, unique), author (**Author**), and price (double). You must also write a class called **Author**. And the **Author** class contains firstName (String) and lastName (String).

2. Write a **BookBag** class. The class contain an array of the **Book** type. The maximum size of the array should be determined by the user when the **BookBag** class is instantiated in the main (**Demo**) class. The **BookBag** class contains the following methods:
    a. insert(Book book): to insert an individual book object into the **Book** array. It should return void.
    b. display(): to display the entire **Book** array on the console. It should return void.
    c. seqentialSearchByISBN(String isbn): to search for a book in the **Book** array by a unique isbn number of a book. It should return the Book object if found or null if the isbn number does not exist.
    d. sequentialSearchByLastName(String lastName): to search for **all the books** in the **Book** array by an author's last name. It should return an array of books written by authors of the same last name.
    e. binarySearchByISBN(String isbn): to search for a book in the sorted **Book** array by a unique isbn number of a book. It should return a **Book** object if found or **null** if the isbn number does not exit.
    f. bubbleSortByIsbn(): to sort all the books in the **Book** array by the isbn number. It should return void.
    g. InsertionSortByLastName(): to sort all the books in the original **Book** array by author's last name. It should return void.
    h. selectionSortByPrice(): to sort all the books in the **Book** array by price. It should return void.
    i. deleteByIsbn(String isbn): to remove the book of a given isbn number from the original **Book** array. It should return the Book object found.
    j. deleteByLastName(String lastName): to remove all books by authors of a given last name from the original **Book** array. It should return a **Book** Array that contains all the **Book**s deleted.

3. Write a main class named **Demo**. The class should create a **BookBag** object filled with 5 book objects. Demonstrate all the methods in the BookBag class to make sure they work properly.

4. Discuss the Big O complexity level of each method in the **BookBag** class. Write your discussion in a text file save the file in package p4.