

Isaac Ray Shoebottom

CS 1083

Assignment 2

3429069

Section A

Source Code (Library.java):

```
import java.util.Scanner;

/**
Represents a personal library.
@author L Bidlake, Isaac Shoebottom (3429069)
*/
public class Library{

    /**
    A collection of books.
    */
    private Book[] library;

    /**
    Constructs a library with the specified collection of books.
    @param library A collection of books.
    */
    public Library(Book[] library){
        this.library = library;
    }

    /**
    Constructs a library by reading in the specified input.
    @param scanIn Input containing a list of books.
    */
    public Library(Scanner scanIn){
        library = new Book[scanIn.nextInt()];
        scanIn.nextLine();

        for(int i = 0; i < library.length; i++){
            Scanner scan = new Scanner(scanIn.nextLine());
```

```

        scan.useDelimiter(",");
        long isbn = scan.nextLong();
        String title = scan.next();
        String author = scan.next();
        int read = scan.nextInt();
        library[i] = new Book(isbn, title, author, read);
    }
    //makes sure the list is sorted after adding from entry.
    bubbleSort(library);

}

/**
This method determines how many books occur in one library and
not the other
@param other Other library to compare books in this library.
@return The number of unique books.
*/
public int findUnique(Library other){
    int counter = 0;
    counter += countUniques(library, other.library);
    counter += countUniques(other.library, library);
    return counter;
}

/**
 * Counts the uniques on one side of an array
 * @param arr1 The first array, the one that the uniques are counted up
against
 * @param arr2 The second array, the array that the first array is compared
against
 * @return Integer of unique books
 */
public static int countUniques(Book[] arr1, Book[] arr2) {

```

```

int counter = 0;
boolean isUnique;
for (Book book1 : arr1) {
    isUnique = true;
    for (Book book2 : arr2) {
        if (book1.getIsbn() < book2.getIsbn())
            break;
        if (book1.getIsbn() == book2.getIsbn()) {
            isUnique = false;
            break;
        }
    }
    if (isUnique) {
        counter++;
    }
}
return counter;
}

```

```

/**
This method merges two libraries (includes both if duplicates).
@param other Library to merge with this library.
@return The library containing all contents of both libraries.
*/
public Library merge(Library other){
    Book[] tempLibrary = new Book[library.length+other.library.length];
    System.arraycopy(library, 0, tempLibrary, 0, library.length);
    System.arraycopy(other.library, 0, tempLibrary, library.length,
other.library.length);

    bubbleSort(tempLibrary);
    return new Library(tempLibrary);
}

```

```

}

/**
 * Sorting algorithm of the bubble variety (in place sort)
 * @param arr Array to be sorted
 */
public static void bubbleSort(Book[] arr) {
    int length = arr.length;
    for (int i = 0; i < length-1; i++)
        for (int j = 0; j < length-i-1; j++)
            if (arr[j].getIsbn() > arr[j+1].getIsbn()) {
                Book temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
}

/**
This method add a book in sorted order by ISBN to this library.
@param bookIn The book to be added to this library in sorted order.
*/
public void addBook(Book bookIn){
    int counter = 0;
    for (Book book: library) {
        if (book.getIsbn() <= bookIn.getIsbn()) {
            counter++;
        }
        else {
            break;
        }
    }
    Book[] tempLibrary = new Book[library.length+1];
    System.arraycopy(library, 0, tempLibrary, 0, counter);
}

```

```
        tempLibrary[counter] = bookIn;
        System.arraycopy(library, counter, tempLibrary, counter+1,
(library.length-counter));
        library = tempLibrary;
    }

    /**
    Creates a formatted print out of the library.
    @return Formatted print out of the library.
    */
    public String toString(){
        String result = "";
        for(int i = 0; i < library.length; i++){
            result += library[i].getIsbn() + "\t" +
                library[i].getTitle() + "\t" +
                library[i].getAuthor() + "\t" +
                library[i].getRead() + "\n";
        }
        return result;
    }
}
```

Section B

Input 1:

This input is the default log provided by the assignment pdf

5

9780006716693,The Last Battle,Lewis,2

9780007591855,The Silmarillion,Tolkien,3

9780048232298,The Lord of the Rings,Tolkien,1

9780385491037,The Robber Bride,Atwood,3

9781400079179,The Da Vinci Code,Brown,2

3

9780048232298,The Lord of the Rings,Tolkien,1

9780062230621,The Confidence Code,Kay,0

9780385491037,The Robber Bride,Atwood,3

9780071079170,The Skin We're In,Cole,5

Input 2:

This input is the default entry with an extra book added to library other to reduce the number of unique books

5

9780006716693,The Last Battle,Lewis,2

9780007591855,The Silmarillion,Tolkien,3

9780048232298,The Lord of the Rings,Tolkien,1

9780385491037,The Robber Bride,Atwood,3

9781400079179,The Da Vinci Code,Brown,2

4

9780048232298,The Lord of the Rings,Tolkien,1

9780062230621,The Confidence Code,Kay,0

9780385491037,The Robber Bride,Atwood,3

9780007591855,The Silmarillion,Tolkien,3

9780071079170,The Skin We're In,Cole,5

Input 3:

This is the default log but with the unique book from the second library copied over to the first library

6

9780006716693,The Last Battle,Lewis,2

9780007591855,The Silmarillion,Tolkien,3

9780048232298,The Lord of the Rings,Tolkien,1

9780385491037,The Robber Bride,Atwood,3

9781400079179,The Da Vinci Code,Brown,2

9780062230621,The Confidence Code,Kay,0

4

9780048232298,The Lord of the Rings,Tolkien,1

9780062230621,The Confidence Code,Kay,0

9780385491037,The Robber Bride,Atwood,3

9780007591855,The Silmarillion,Tolkien,3

9780071079170,The Skin We're In,Cole,5

Input 4:

This is an input with both libraries being the same thing

6

9780006716693,The Last Battle,Lewis,2

9780007591855,The Silmarillion,Tolkien,3

9780048232298,The Lord of the Rings,Tolkien,1

9780385491037,The Robber Bride,Atwood,3

9781400079179,The Da Vinci Code,Brown,2

9780062230621,The Confidence Code,Kay,0

6

9780006716693,The Last Battle,Lewis,2

9780007591855,The Silmarillion,Tolkien,3

9780048232298,The Lord of the Rings,Tolkien,1

9780385491037,The Robber Bride,Atwood,3

9781400079179,The Da Vinci Code,Brown,2

9780062230621,The Confidence Code,Kay,0

9780071079170,The Skin We're In,Cole,5

Input 5:

This input is two libraries that are completely unique

5

9780006716693,The Last Battle,Lewis,2
9780007591855,The Silmarillion,Tolkien,3
9780048232298,The Lord of the Rings,Tolkien,1
9780385491037,The Robber Bride,Atwood,3
9781400079179,The Da Vinci Code,Brown,2
1
9780062230621,The Confidence Code,Kay,0
9780071079170,The Skin We're In,Cole,5

Section C

Log 1:

This log is the default log provided by the assignment pdf

```
9780006716693The Last Battle    Lewis    2
9780007591855The Silmarillion  Tolkien   3
9780048232298The Lord of the Rings    Tolkien   1
9780385491037The Robber Bride    Atwood   3
9781400079179The Da Vinci Code    Brown    2

9780048232298The Lord of the Rings    Tolkien   1
9780062230621The Confidence Code Kay    0
9780385491037The Robber Bride    Atwood   3
```

Number of unique books: 4

My Library after adding a book:

```
9780006716693The Last Battle    Lewis    2
9780007591855The Silmarillion  Tolkien   3
9780048232298The Lord of the Rings    Tolkien   1
9780071079170The Skin We're In    Cole     5
9780385491037The Robber Bride    Atwood   3
```

9781400079179The Da Vinci Code Brown 2

Merged Libraries:

9780006716693The Last Battle Lewis 2

9780007591855The Silmarillion Tolkien 3

9780048232298The Lord of the Rings Tolkien 1

9780048232298The Lord of the Rings Tolkien 1

9780062230621The Confidence Code Kay 0

9780071079170The Skin We're In Cole 5

9780385491037The Robber Bride Atwood 3

9780385491037The Robber Bride Atwood 3

9781400079179The Da Vinci Code Brown 2

Log 2:

This log is the default entry with an extra book added to library other to reduce the number of unique books

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780385491037	The Robber Bride	Atwood	3

Number of unique books: 3

My Library after adding a book:

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780071079170	The Skin We're In	Cole	5
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

Merged Libraries:

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780071079170	The Skin We're In	Cole	5
9780385491037	The Robber Bride	Atwood	3
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

Log 3:

This is the default log but with the unique book from the second library copied over to the first library

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780385491037	The Robber Bride	Atwood	3

Number of unique books: 2

My Library after adding a book:

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780071079170	The Skin We're In	Cole	5
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

Merged Libraries:

9780006716693	The Last Battle	Lewis	2
9780007591855	The Silmarillion	Tolkien	3
9780007591855	The Silmarillion	Tolkien	3
9780048232298	The Lord of the Rings	Tolkien	1
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780062230621	The Confidence Code	Kay	0
9780071079170	The Skin We're In	Cole	5
9780385491037	The Robber Bride	Atwood	3
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2

Log 4:

This is a log with both libraries being the same thing

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780062230621	The Confidence Code	Kay	0	
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780062230621	The Confidence Code	Kay	0	
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	

Number of unique books: 0

My Library after adding a book:

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780062230621	The Confidence Code	Kay	0	
9780071079170	The Skin We're In	Cole	5	
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	

Merged Libraries:

9780006716693	The Last Battle	Lewis	2	
9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780007591855	The Silmarillion	Tolkien	3	

9780048232298	The Lord of the Rings	Tolkien	1
9780048232298	The Lord of the Rings	Tolkien	1
9780062230621	The Confidence Code	Kay	0
9780062230621	The Confidence Code	Kay	0
9780071079170	The Skin We're In	Cole	5
9780385491037	The Robber Bride	Atwood	3
9780385491037	The Robber Bride	Atwood	3
9781400079179	The Da Vinci Code	Brown	2
9781400079179	The Da Vinci Code	Brown	2

Log 5:

This log is two libraries that are completely unique

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	
9780062230621	The Confidence Code	Kay	0	

Number of unique books: 6

My Library after adding a book:

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780071079170	The Skin We're In	Cole	5	
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	

Merged Libraries:

9780006716693	The Last Battle	Lewis	2	
9780007591855	The Silmarillion	Tolkien	3	
9780048232298	The Lord of the Rings	Tolkien		1
9780062230621	The Confidence Code	Kay	0	
9780071079170	The Skin We're In	Cole	5	
9780385491037	The Robber Bride	Atwood	3	
9781400079179	The Da Vinci Code	Brown	2	