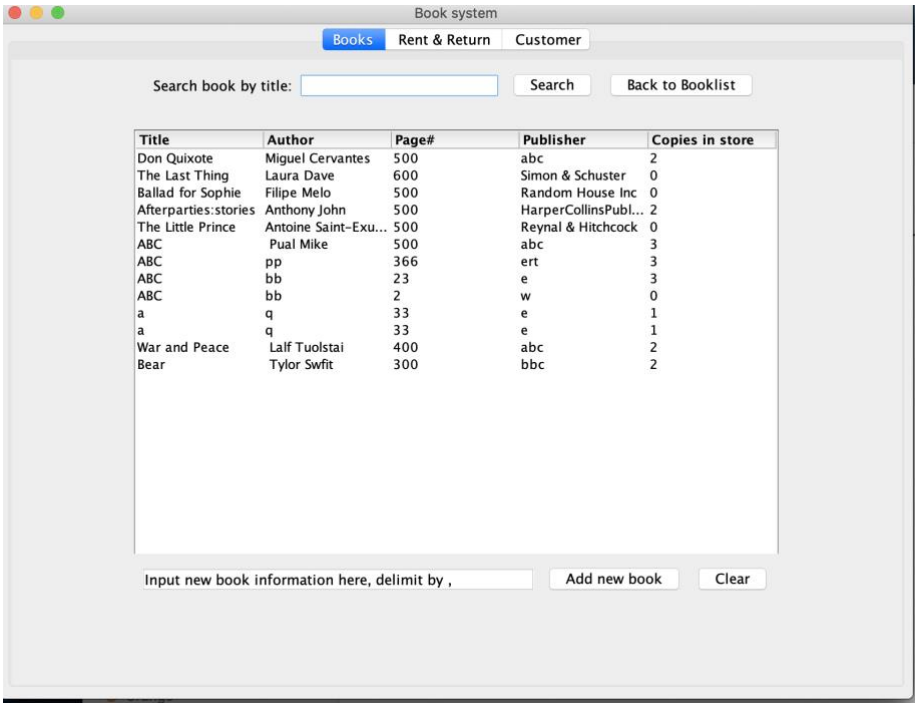
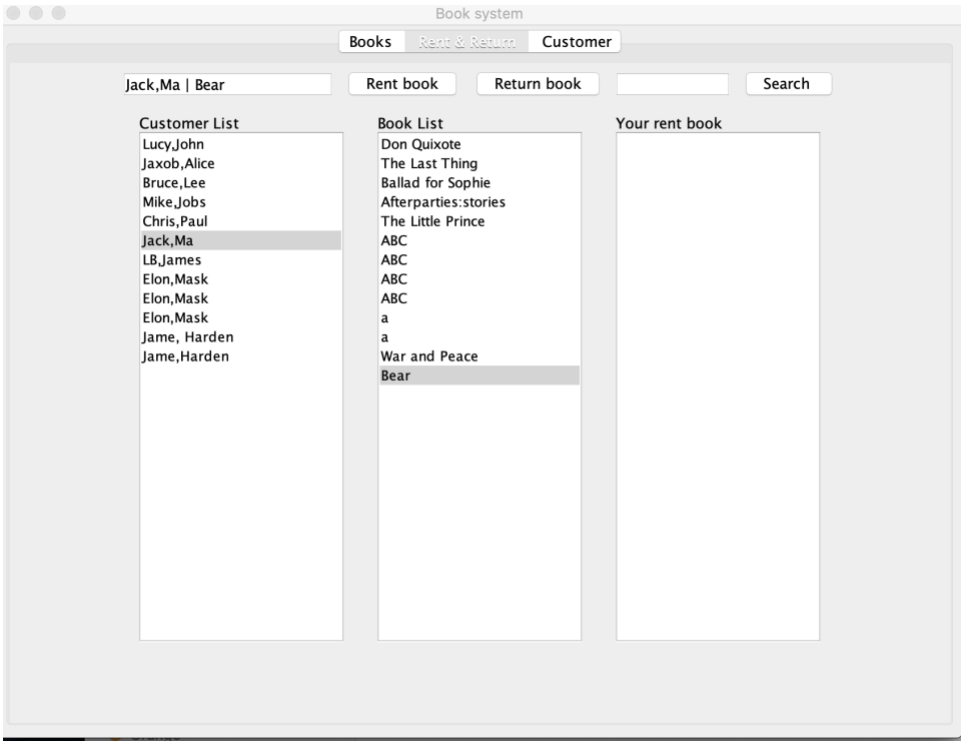
CS203 Project Report

Introduction

The aim of the project is to use Java to write a software for a bookstore. This system could display the book list, the customer list and the rent book list of a customer by java GUI. Users could search a book by a book name or author name, or search a book by a customer name, email address or phone number. The owner of the software can **add** new books or new customer to his/her database through the GUI. When renting a book or returning a book, the copies numbers and his rent record will be updated. User could also search what books he/she has rent by input his last name. Three txt files Booklist.txt, Customerlist.txt and BookCustomerlist.txt were used to store the information of books, customers and customer's renting record. These information was read into ArrayList objects, and visualized by Java swing JTable and JList. Users could click different tab to display 3 types of information (Figure 1a-c). All renting or returning actions will be write into three txt files dynamically.





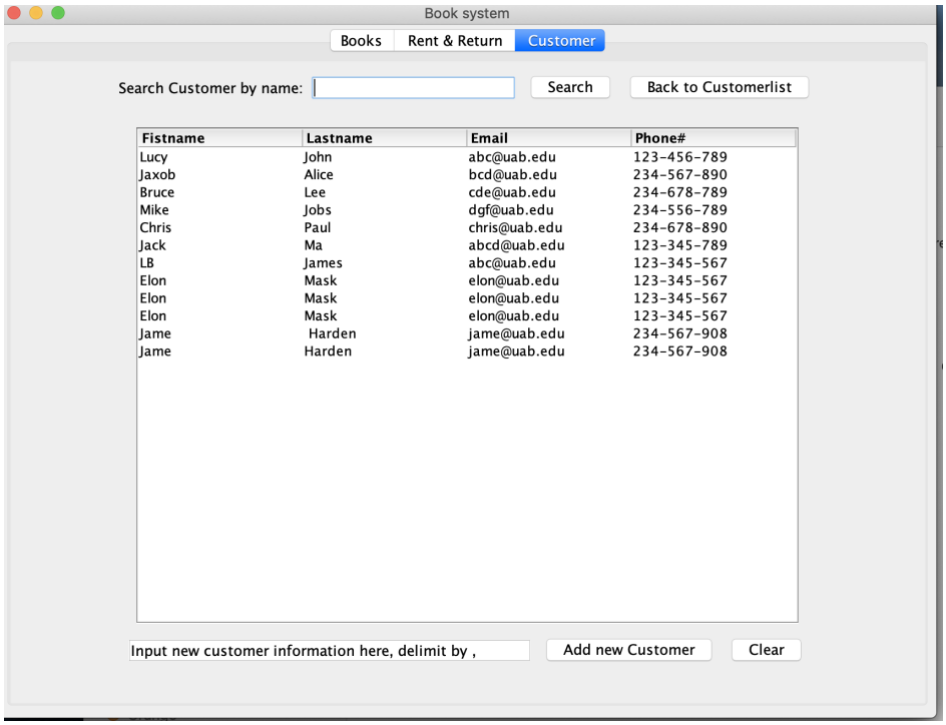


Figure 1 The Booklist tab, Rent & Return tab and Customerlist tab(from up to down).

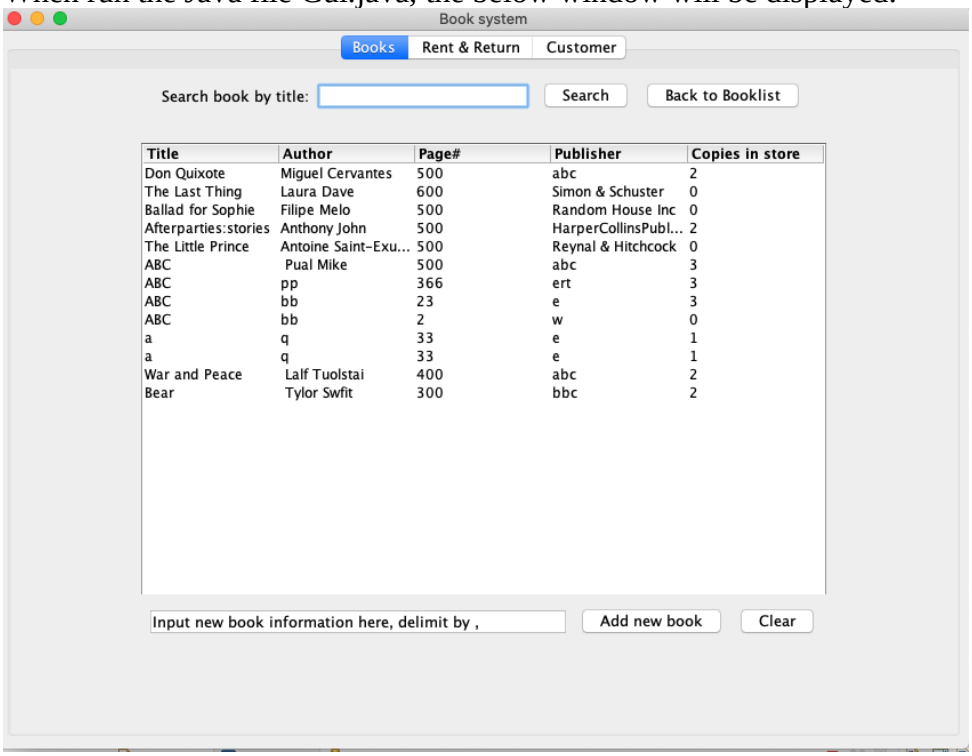
Code interpretation

There are 9 files for this software. Class BookList, CustomerList and BookCustomer have silimar structures, and contain private variables such as title, author, pagenNmber, firstname, lastname, email and phone etc. These 3 classes have constructors and the methods, such as setters, getters and mutators(rentCopies(), returnCopies() in class Booklist for updating copy numbers) and toString. Class BookListBack, CustomerlistBack and BookCustomerList establish ArrayList objects ArrayList<BookList> Book, ArrayList<Customerlist> Customer and ArrayList<BookCustomer> BKC respectively, and they also had method to read data from txt file into its respective ArrayList. In addition, class BookTableModel and CustomerTableModel were created to build table for JTables in tab Book and Customer. These 2 classes inherent from AbstractTableModel, which was provided by javax.swing.table.AbstractTableModel. Class Gui inherented JFrame and implements ListSelectionListener. This class establish Jtables, JList,JButton, JTextField and JLabels. And all these components were added into JTabbedPane. This formed the major structure of this software.

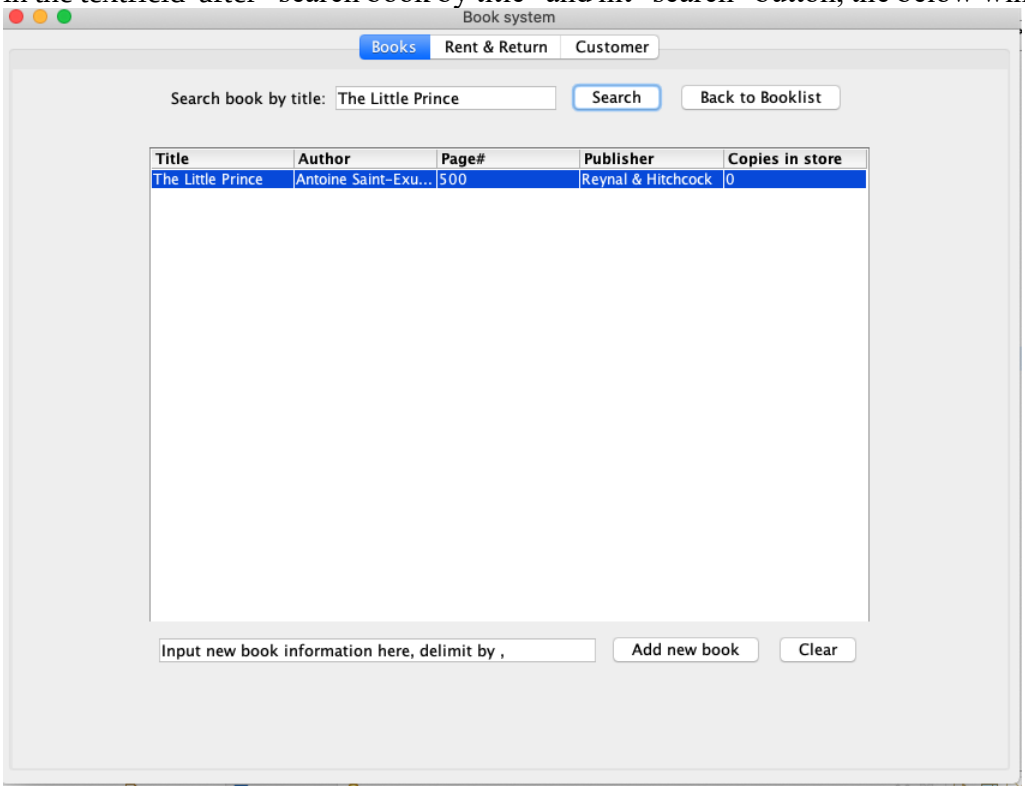
Result: performance of this system

1. **Add, view and search books**

When run the Java file Gui.java, the below window will be displayed:

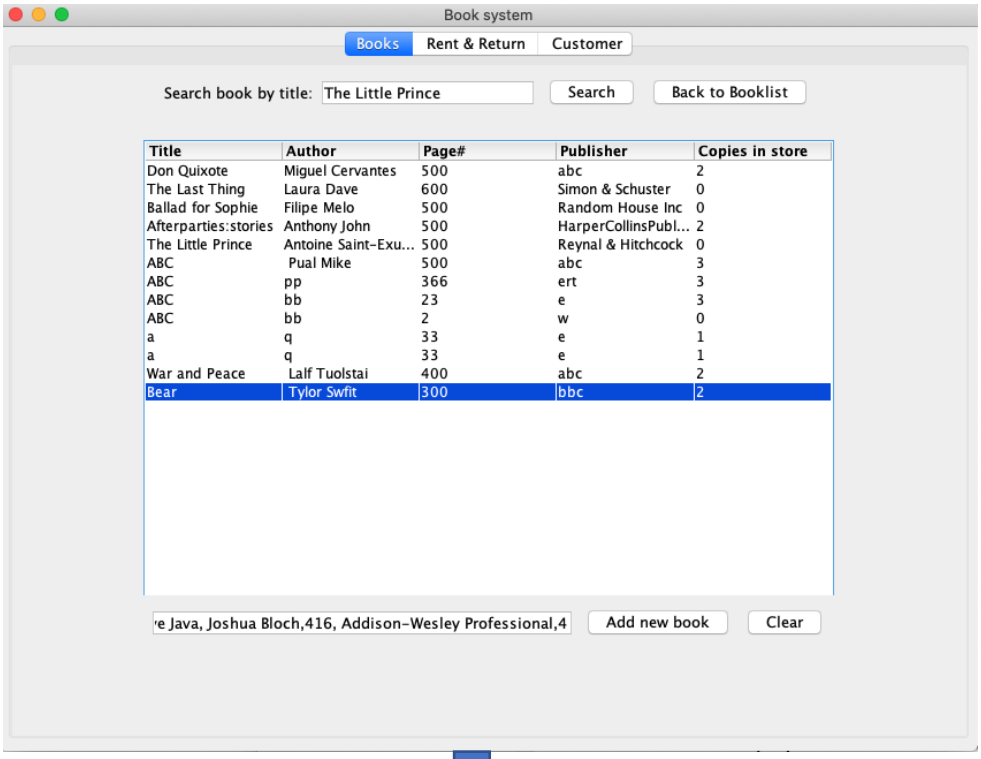


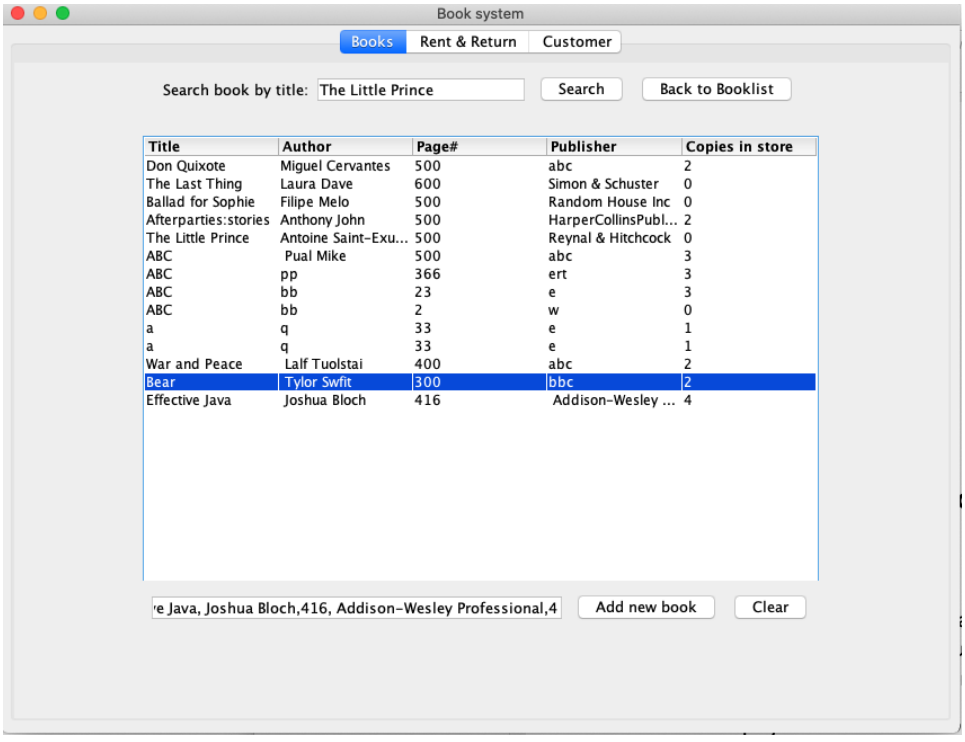
All books in the database(Booklist.txt) will be displayed in the table. If you input “The Little Prince” in the textfield after “search book by title” and hit “search” button, the below window is displayed:



And you can hit “Back to Booklist” button to go back the initial Booklist view.

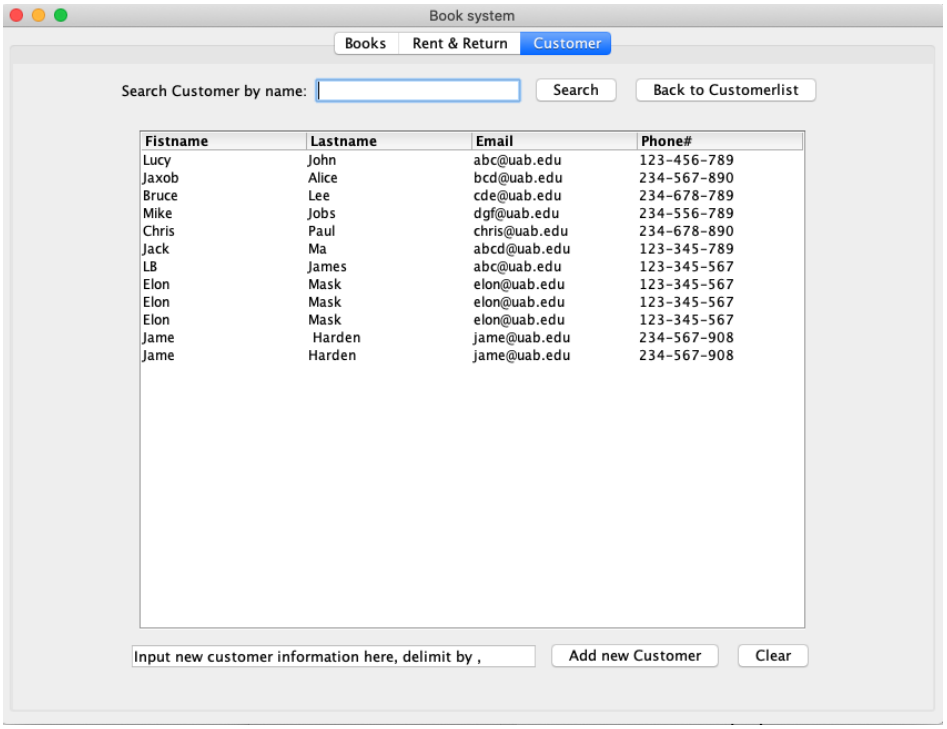
When the bookstore owner has new books arrival, he/she can add these books to his/her database from textfield “Input new book information here, delimit by ,”. For example, hit “Clear” button and input “Effective Java, Joshua Bloch,416, Addison-Wesley Professional,4”, and then hit the button “Add new book”. This new book is added successfully. See below the view change.


Book system
Books
Rent & Return
Customer
Search book by title:
The Little Prince
Search
Back to Booklist
Title
Author
Page#
Publisher
Copies in store
Don Quixote
Miguel Cervantes
500
abc
2
The Last Thing
Laura Dave
600
Simon & Schuster
0
Ballad for Sophie
Filipe Melo
500
Random House Inc
0
Afterparties:stories
Anthony John
500
HarperCollinsPubl...
2
The Little Prince
Antoine Saint-Exu...
500
Reynal & Hitchcock
0
ABC
Pual Mike
500
abc
3
ABC
pp
366
ert
3
ABC
bb
23
e
3
ABC
bb
2
w
0
a
q
33
e
1
a
q
33
e
1
War and Peace
Lalf Tuolstai
400
abc
2
Bear
Tylor Swfit
300
bbc
2
'e Java, Joshua Bloch,416, Addison-Wesley Professional,4
Add new book
Clear

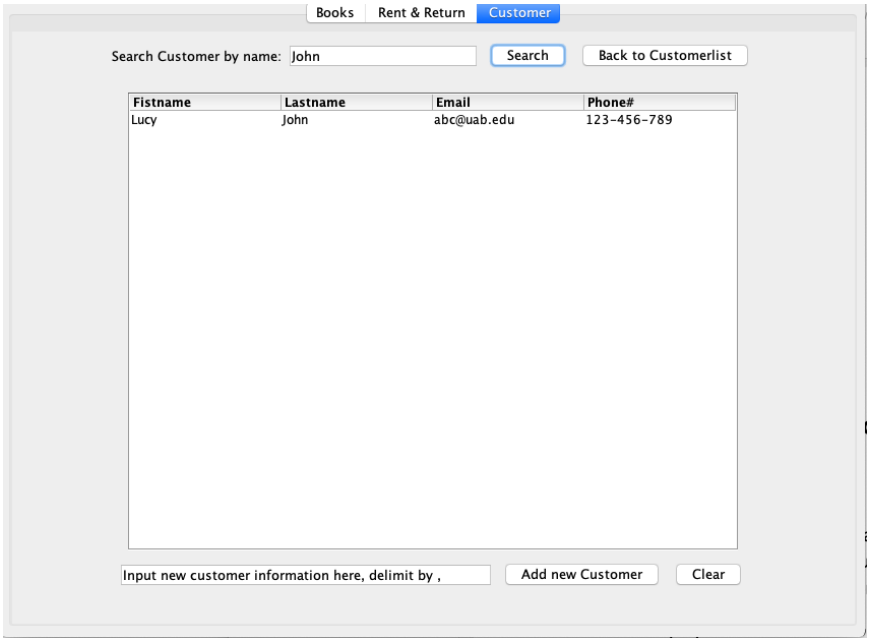

Book system
Books
Rent & Return
Customer
Search book by title:
The Little Prince
Search
Back to Booklist
Title
Author
Page#
Publisher
Copies in store
Don Quixote
Miguel Cervantes
500
abc
2
The Last Thing
Laura Dave
600
Simon & Schuster
0
Ballad for Sophie
Filipe Melo
500
Random House Inc
0
Afterparties:stories
Anthony John
500
HarperCollinsPubl...
2
The Little Prince
Antoine Saint-Exu...
500
Reynal & Hitchcock
0
ABC
Pual Mike
500
abc
3
ABC
pp
366
ert
3
ABC
bb
23
e
3
ABC
bb
2
w
0
a
q
33
e
1
a
q
33
e
1
War and Peace
Lalf Tuolstai
400
abc
2
Bear
Tylor Swfit
300
bbc
2
Effective Java
Joshua Bloch
416
Addison-Wesley ...
4
'e Java, Joshua Bloch,416, Addison-Wesley Professional,4
Add new book
Clear

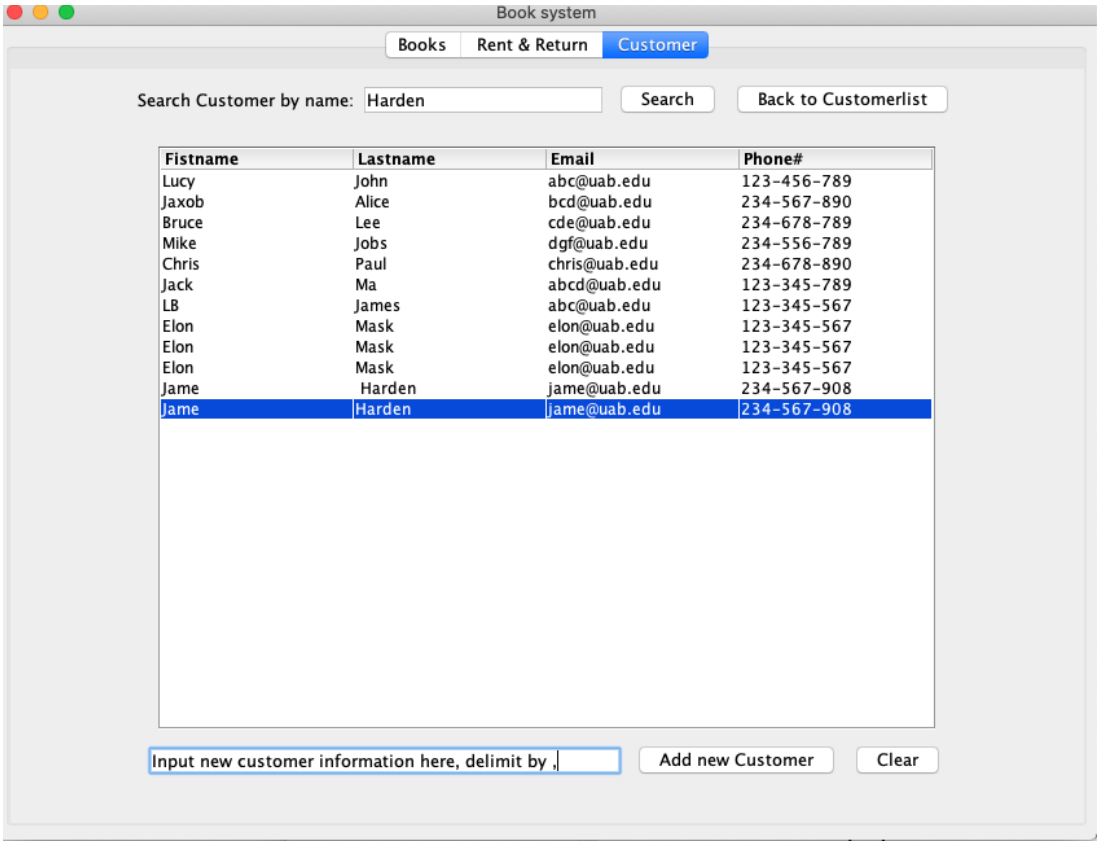
2. Add, view and search customers

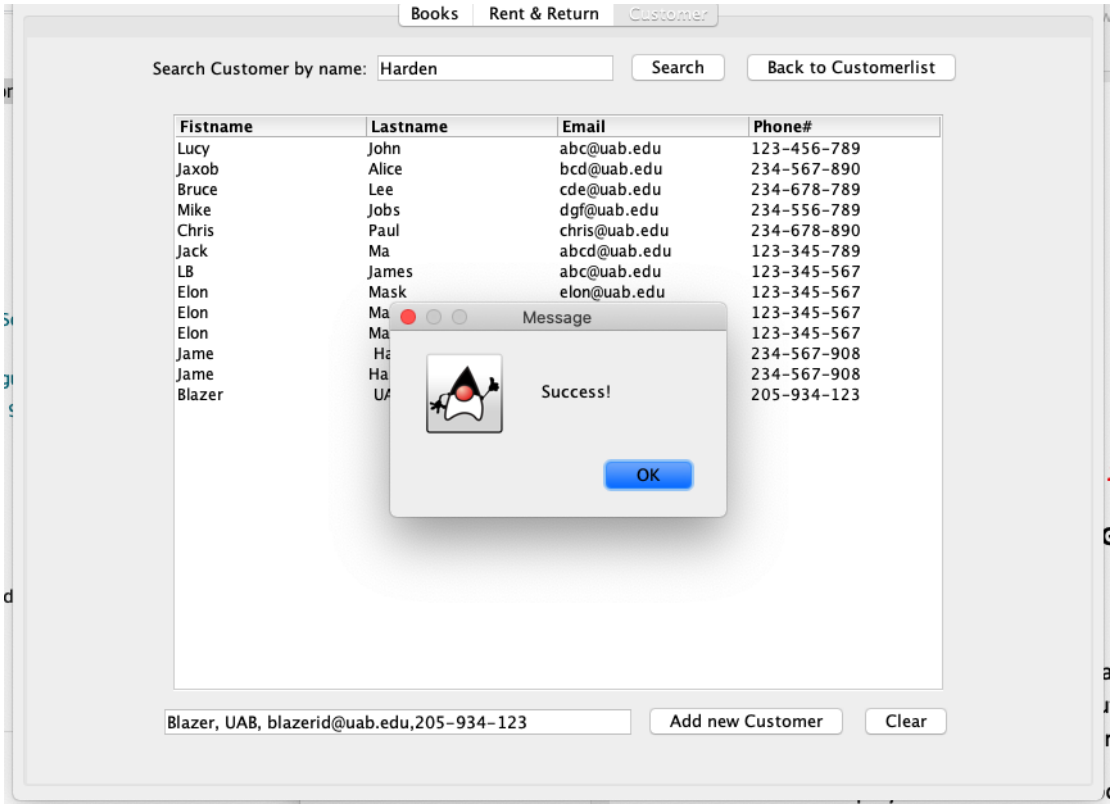
When hits the tab “Customer”, the view is changed to the following:

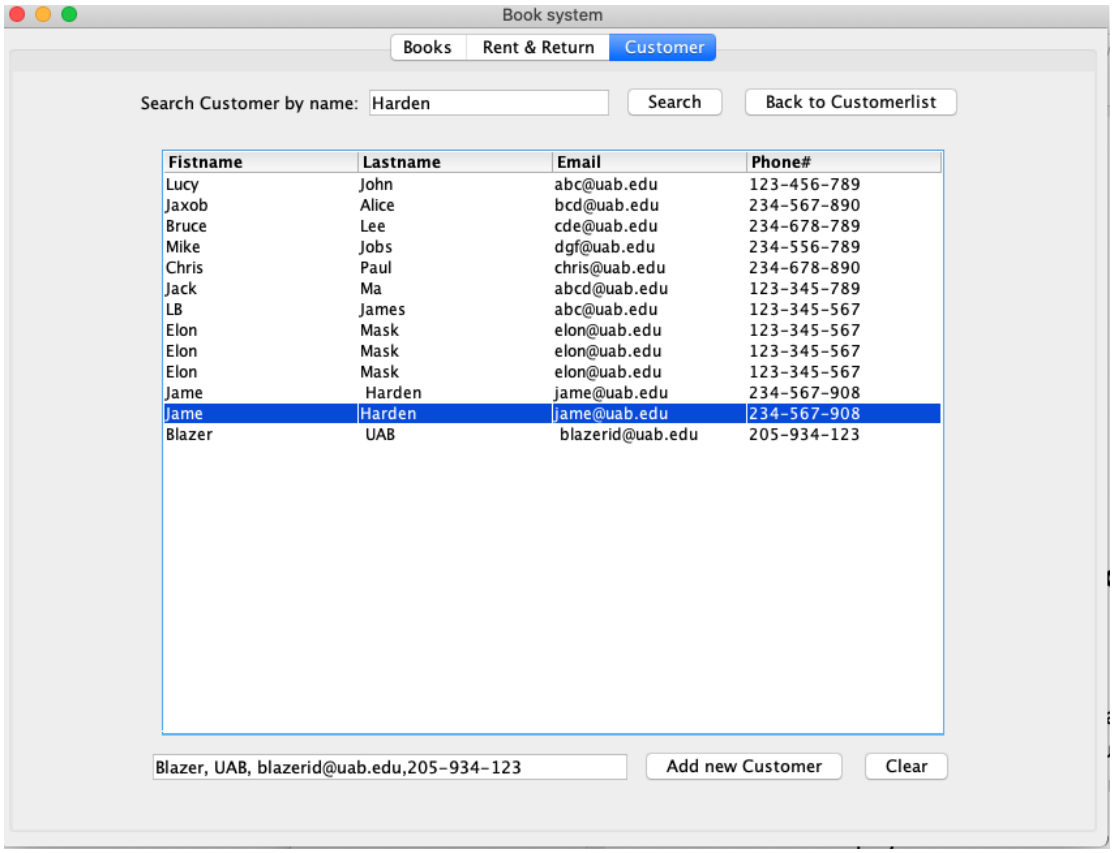


Similarly, it has the function of add, search and view customers. A few views are shown below:




Book system
Books
Rent & Return
Customer
Search Customer by name:
Harden
Search
Back to Customerlist
Fistname
Lastname
Email
Phone#
Lucy John abc@uab.edu 123-456-789
Jaxob Alice bcd@uab.edu 234-567-890
Bruce Lee cde@uab.edu 234-678-789
Mike Jobs dgf@uab.edu 234-556-789
Chris Paul chris@uab.edu 234-678-890
Jack Ma abcd@uab.edu 123-345-789
LB James abc@uab.edu 123-345-567
Elon Mask elon@uab.edu 123-345-567
Elon Mask elon@uab.edu 123-345-567
Elon Mask elon@uab.edu 123-345-567
Jame Harden jame@uab.edu 234-567-908
Jame Harden jame@uab.edu 234-567-908
Input new customer information here, delimit by ,
Add new Customer
Clear

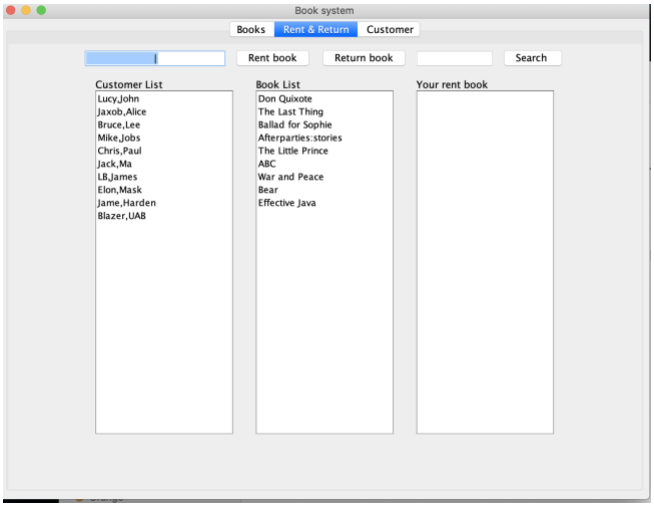

Books
Rent & Return
Customer
Search Customer by name:
Harden
Search
Back to Customerlist
Fistname
Lastname
Email
Phone#
Lucy John abc@uab.edu 123-456-789
Jaxob Alice bcd@uab.edu 234-567-890
Bruce Lee cde@uab.edu 234-678-789
Mike Jobs dgf@uab.edu 234-556-789
Chris Paul chris@uab.edu 234-678-890
Jack Ma abcd@uab.edu 123-345-789
LB James abc@uab.edu 123-345-567
Elon Mask elon@uab.edu 123-345-567
Elon 123-345-567
Elon 123-345-567
Jame 234-567-908
Jame 234-567-908
Blazer 205-934-123
Message
Success!
OK
Blazer, UAB, blazerid@uab.edu,205-934-123
Add new Customer
Clear

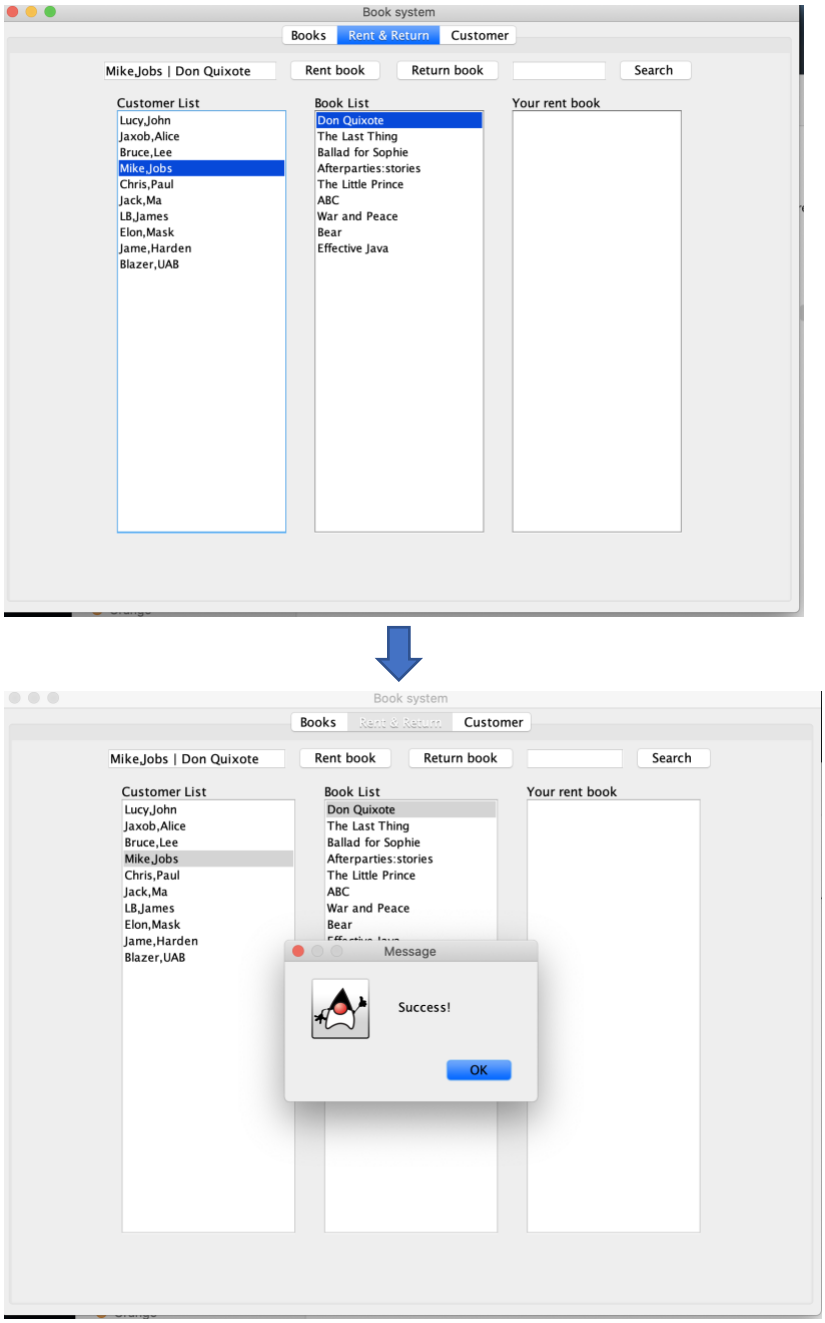


3. Rent/return books and search someone's rent list

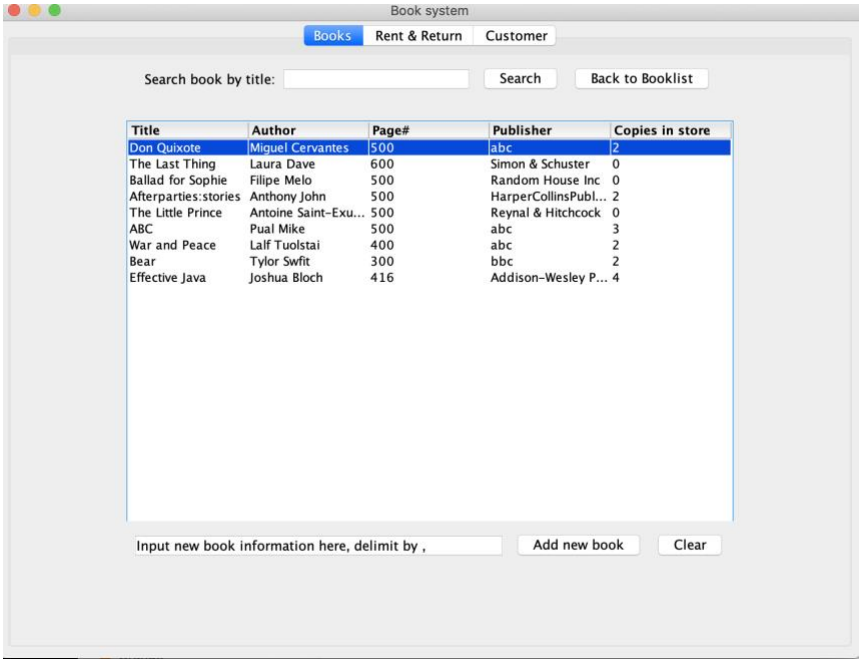
When hits the tab "Rent & Return", the view is changed to the following:

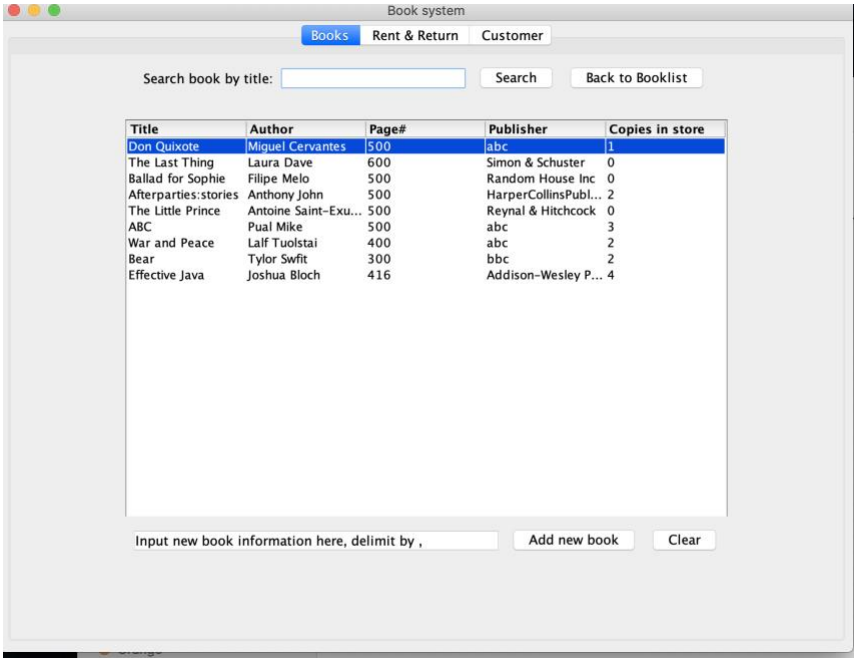
a)Rent In the Customer List and Book List, selected the name of Customer and book title you want to rent, and hit the button "Rent book". If the copy numbers of book you want to rent is >1, then the view change like this:



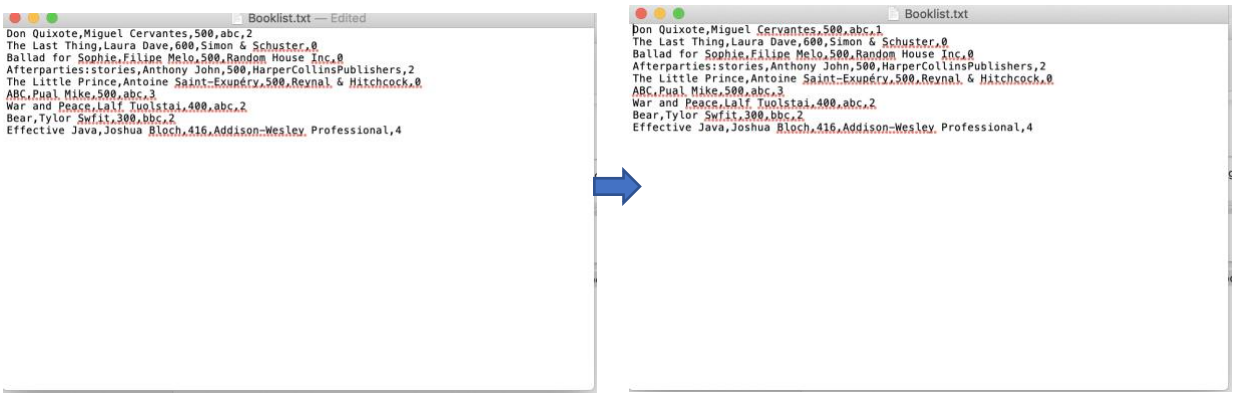


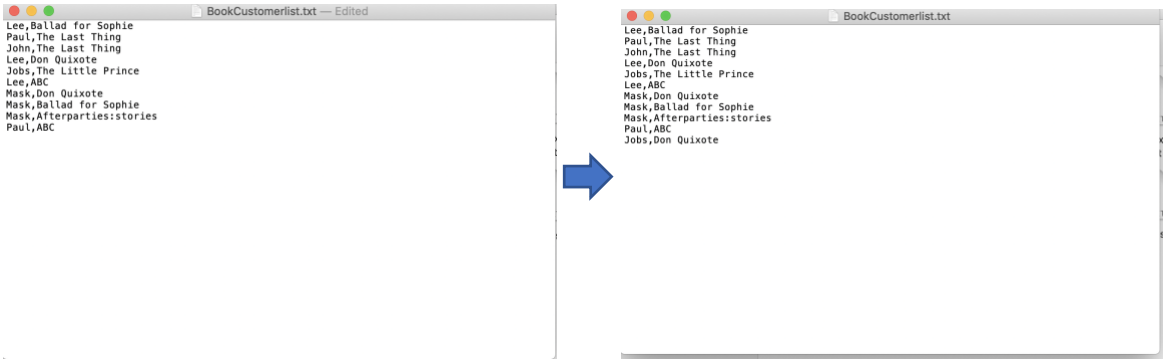
And if you go back to the tab Books, you will find its copy number also change from 2 to 1.



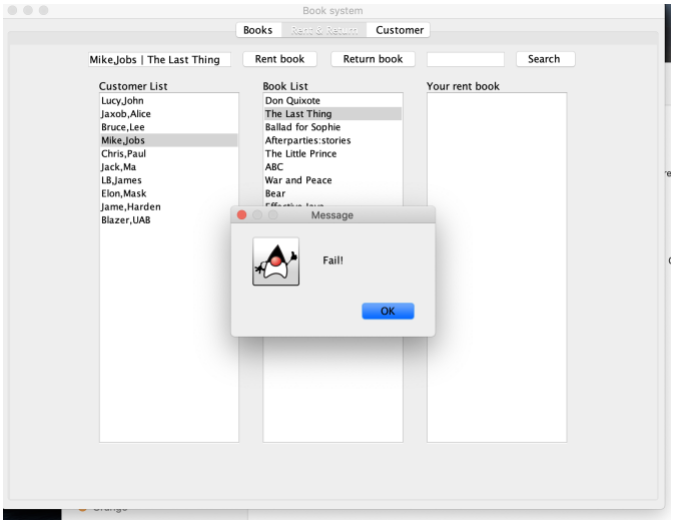


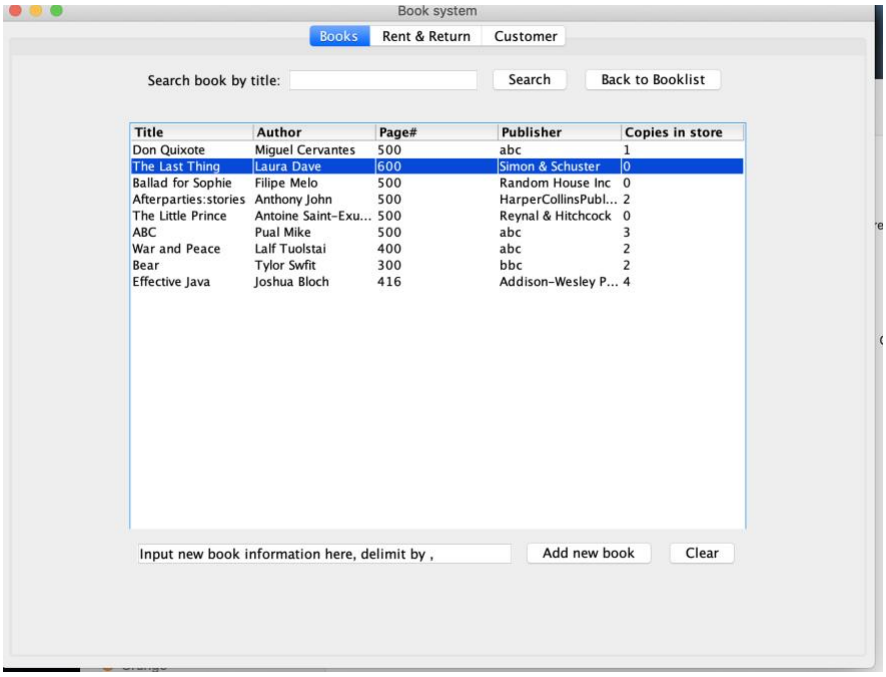
Also, if you check the database files, you will find the copy number also changes.





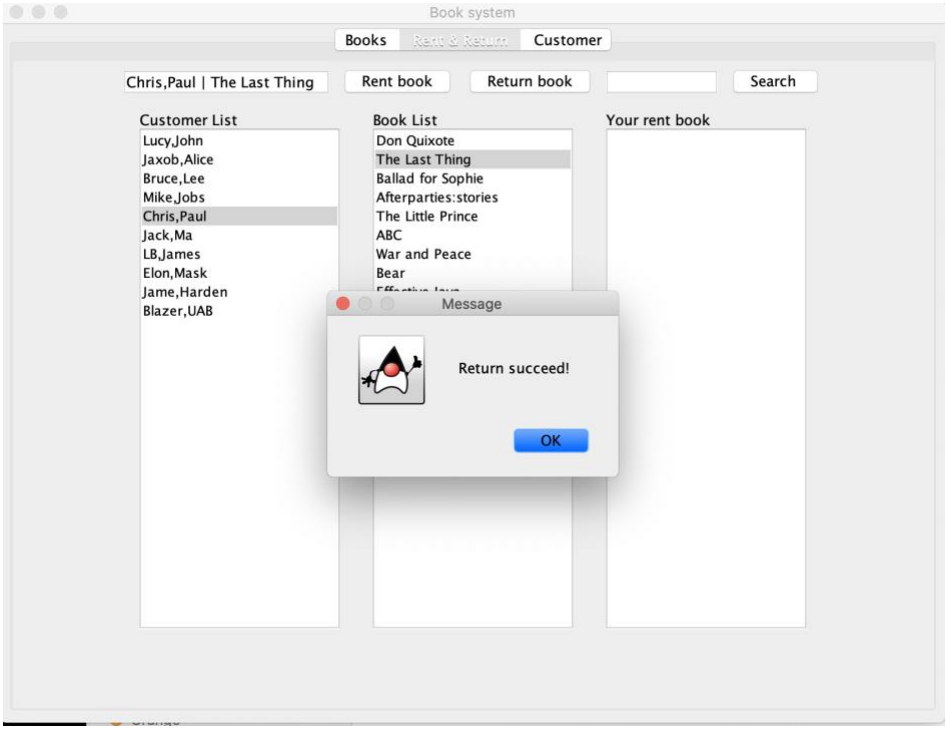
If the copies number of book you want to rent is 0, then it will show you rent fail. It will show like this:



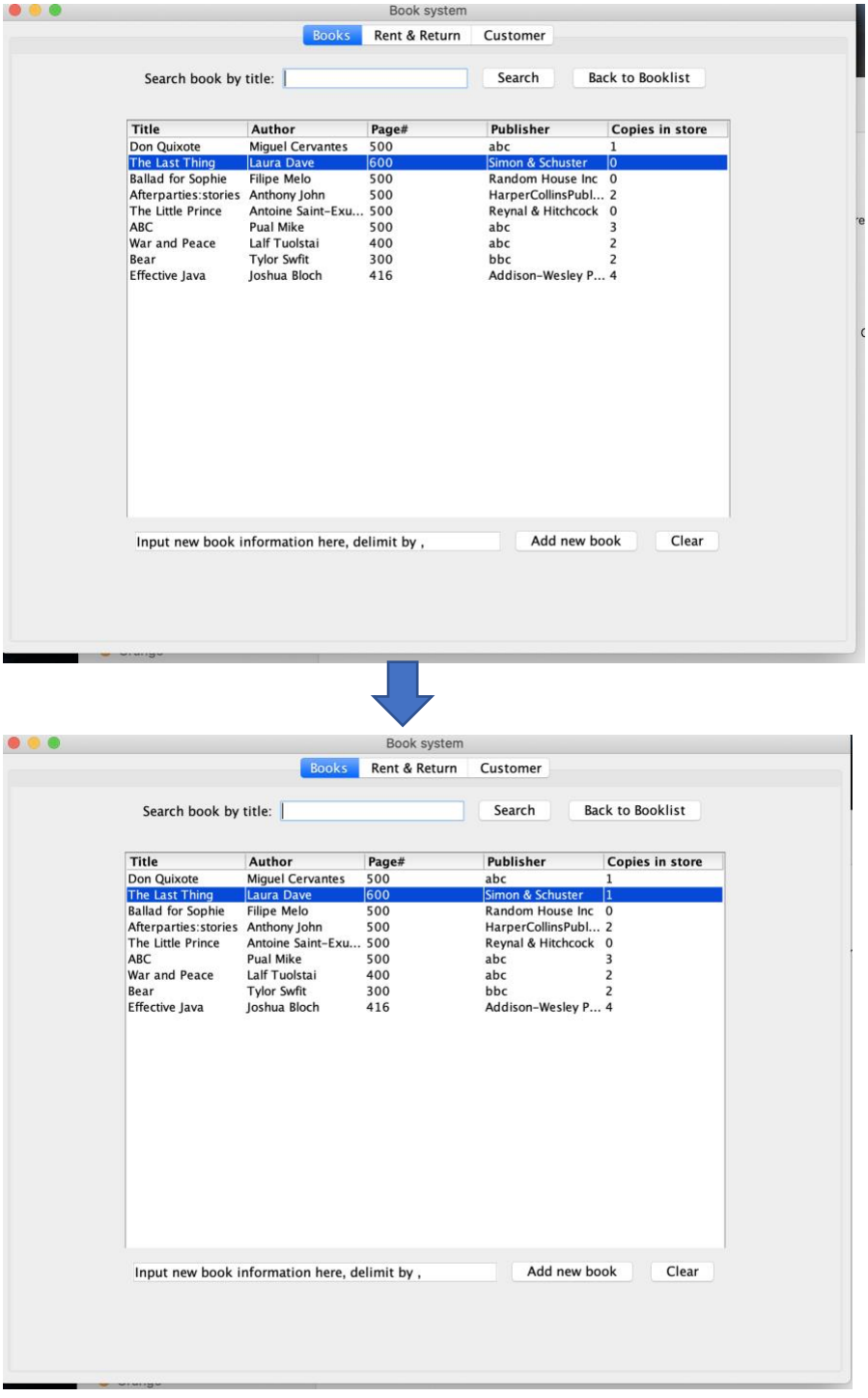


And the database will not update.

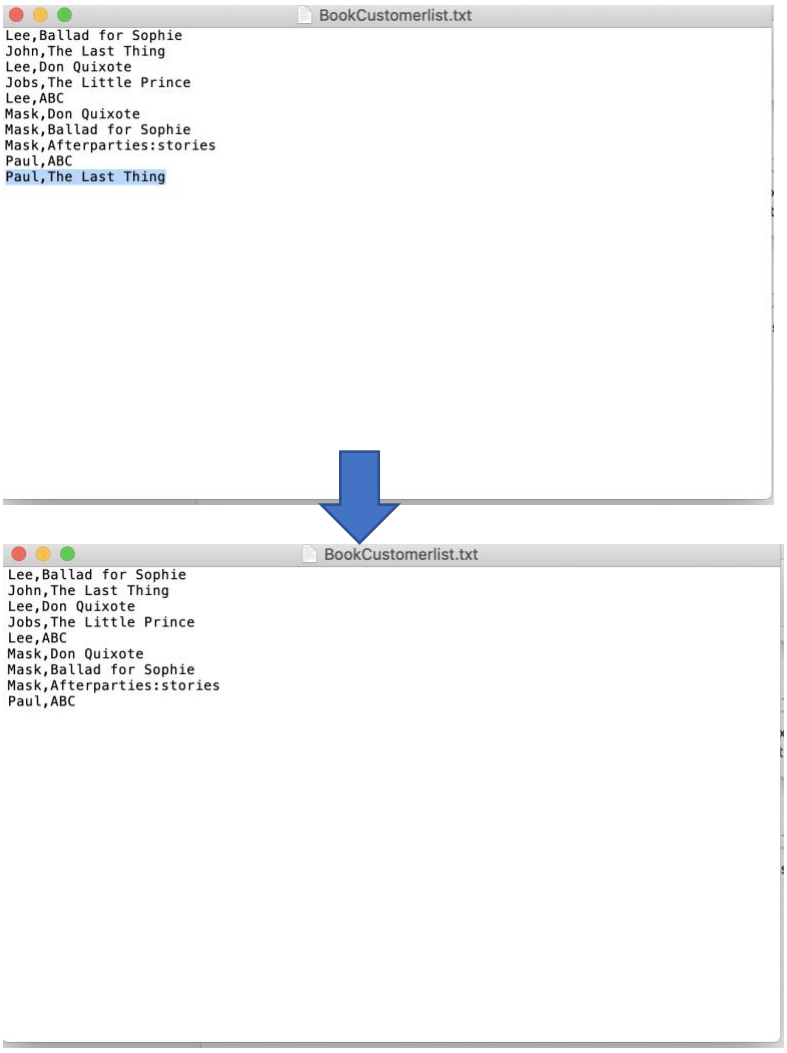
b) Return When you return a book, just select the book title and you last in the list, and hit the button “Return book”. It will show this view:



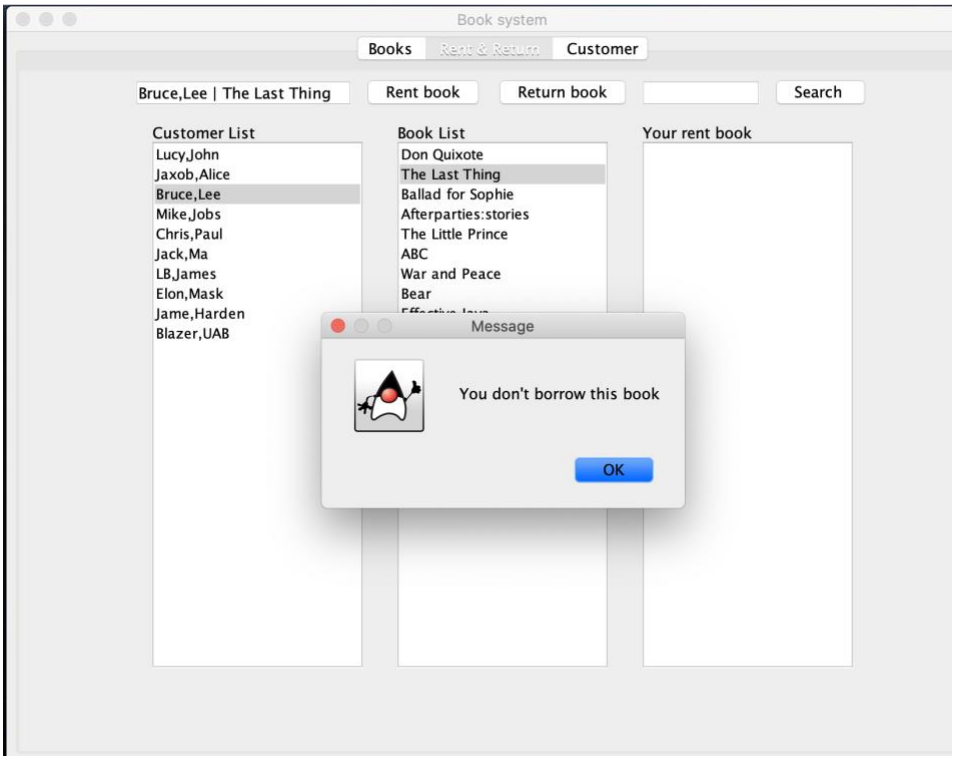
And the copies number will increase by 1



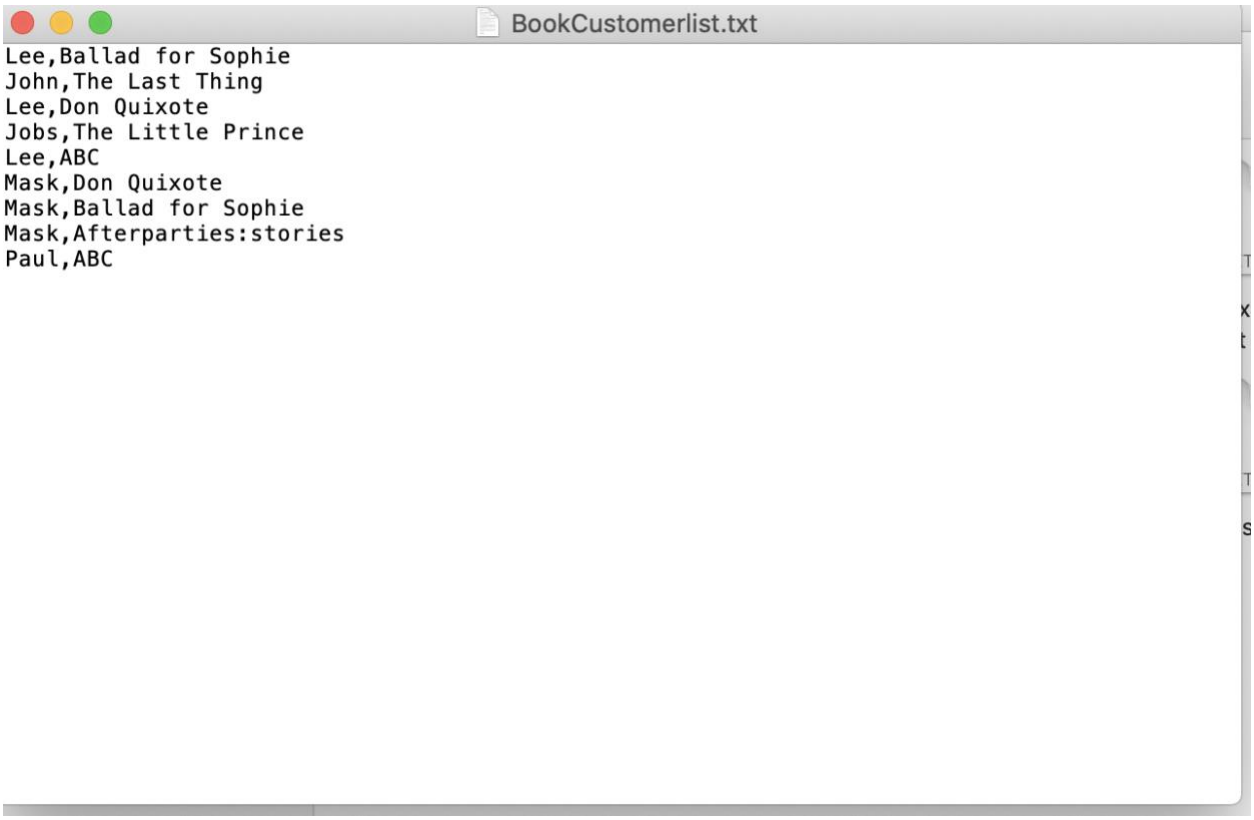
And the database also changes, see below: the record for your rent has remove from the database.



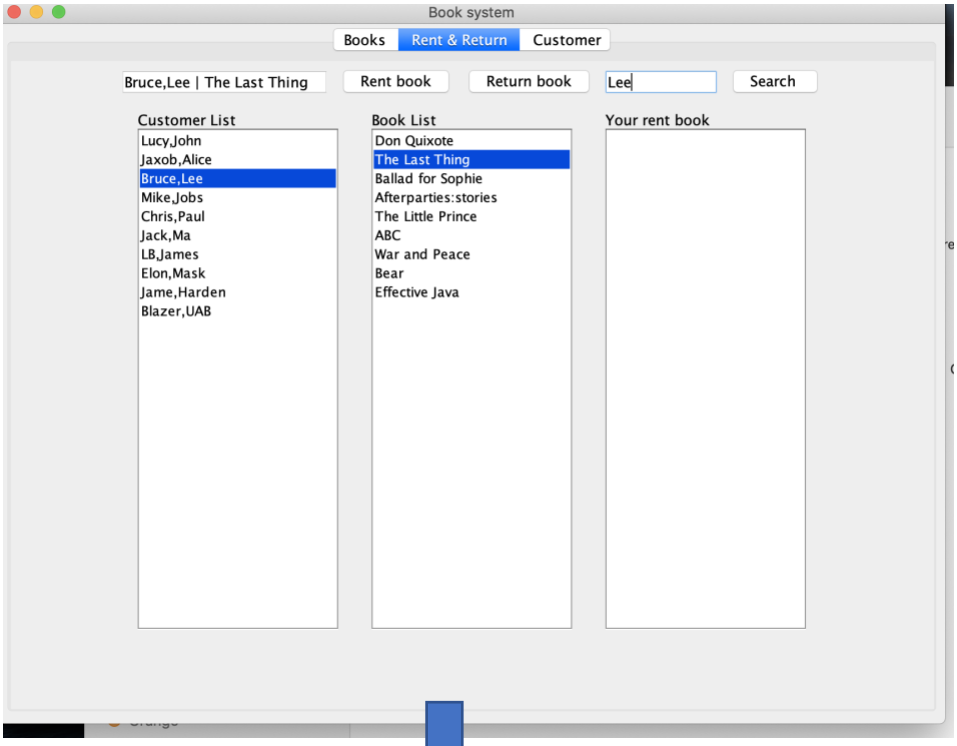
If you return your rent book to other's name, it will tell you did not rent this book

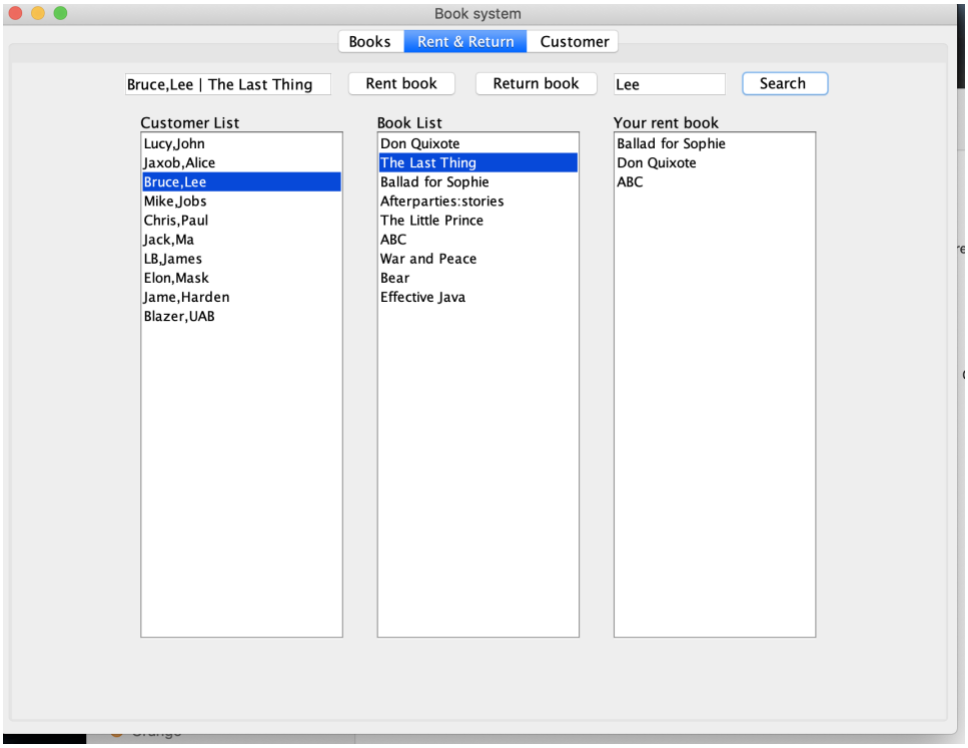


Of course, the database does not have this record you selectes

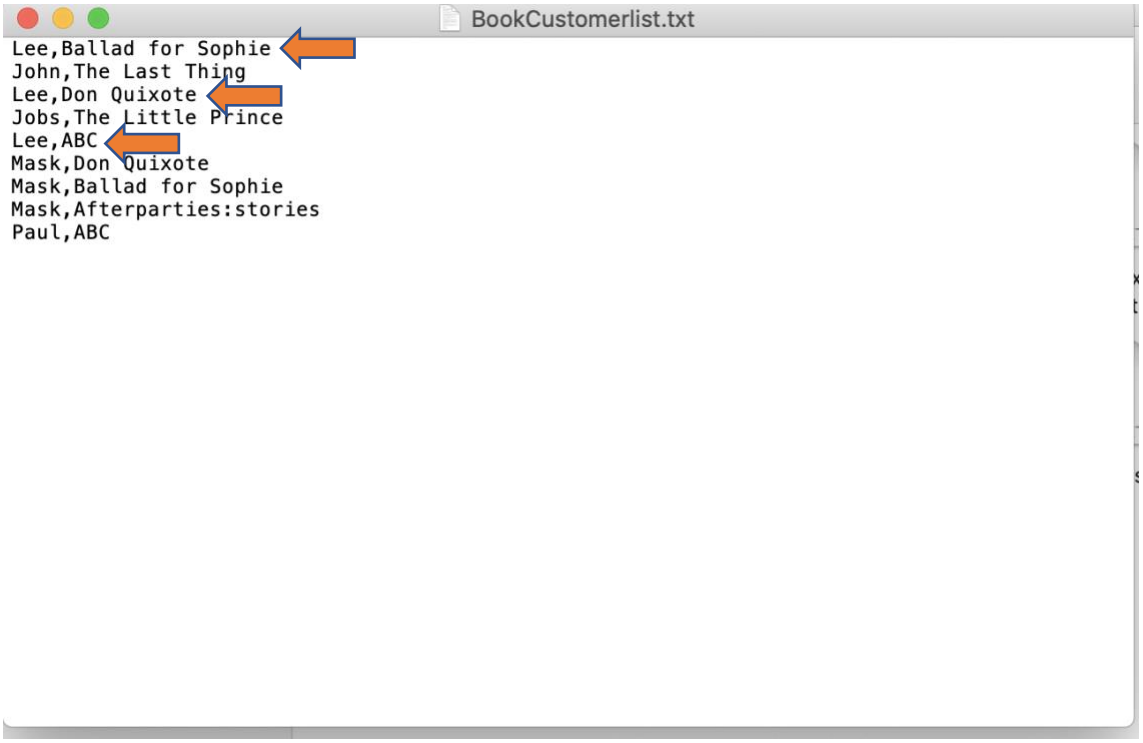


c) Search the rent list of a customer You can input the last name to check his rent, For example, Bruce Lee. If you input “Lee” in the right corner, and hit “search” button. His rent list will be display:





If you go to database file to check the record, you will find Lee indeed rent these three books.



Reference

1. https://web.mit.edu/6.005/www/sp14/psets/ps4/java-6-tutorial/components.html
2. https://docs.oracle.com/javase/tutorial/uiswing/layout/visual.html
3. http://www2.hawaii.edu/~takebaya/ics111/jtable_custom/jtable_custom.html(Build JTable)
4. https://stackoverflow.com/questions/8104692/how-to-avoid-java-util-concurrentmodificationexception-when-iterating-through-an (remove element from JList)
5. https://examples.javacodegeeks.com/java-swing-layouts-example/ (Layout design)
6. https://stackoverflow.com/questions/4408644/how-can-i-change-the-font-of-a-jtables-header (set JTable Header)
7. https://coderanch.com/t/333947/java/Add-Row-AbstractTableModel (Dynamically Add row to JTable for AbstractTable Model)
8. http://www.seasite.niu.edu/cs580java/JList_Basics.htm (Dynamically add/remove element to JList)