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# Library Database Final Report


**Team 6: Red Pandas (5 Members):**

| | | |
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**Narrative Description:**

Libraries have a large amount of data from information on books within the library and the members of the library. In order to manage this we as a group have decided to make a database to store all the information that the library has within their respective tables. We have decided to make a Library management system. We may be able to create a database where we can store the information of books by their ID, author, genre and topic. We will then be able to see which one is still in stock or has been checked out. We may also be able to use a database for students for a way to see who is a student,who has their student ID card, if they have an overdue library book, if they checked out a book, and how long they have had the book for. If the student or person does have an overdue book we may also be able to tell them how much money they owe the library depending on how long the book has been missing.

**Information Needed:**

The information that would solve the problem contains the following:
The books would have to be a book identification number, the title, the author's last name, the author's first name, the genre, the location, and the availability of the book. The information required for the members of the library would have to be an ID number, their first and last name, their fees, the membership status, their checked out books,their email address, the checked out items due dates.

**List of Tables:**

Member Information Table:

| ID# | Last Name | First Name | Email Address | Phone # | Fees |
|---|---|---|---|---|---|

Member Status Information Table:

| ID# | Member Status | Member Rank | Date Added | Date Left |
|---|---|---|---|---|

Book Availability:

| Book ID | # of copies | # checked out |
|---|---|---|

Book Info:

| Book ID | Author ID | Book Title | Genre | Section | Publisher | Price(if bought) |
|---|---|---|---|---|---|---|

Checked Out Items:

| Item ID | Member ID | Check Out Date | Check In Date | Due Date |
|---|---|---|---|---|

DVD:

| DVD ID | Title | Genre | Price(if bought) |
|---|---|---|---|

Author Info:

| Author ID | Author's Last Name | Author's First Name | Country |
|---|---|---|---|

Purchases:

| Order # | Member ID | Item ID | Date Purchased |
|---|---|---|---|

Printer Points:

| Member ID | # of points | Refresh Date |
|---|---|---|

Computer Time:

| Member ID | Amount of time | Refresh Date |
|---|---|---|

**Relationships:**

MEMBER has a MEMBER_STATUS

MEMBER makes PURCHASES of DVD's and BOOKS

MEMBER checks out and checks in DVD and BOOKS

MEMBER can have MEMBER_LATE_FEES

MEMBER has PRINTER_POINTS and COMPUTER_TIME

BOOKS has BOOK_AVAIBILITY

AUTHOR wrote BOOKS

**Informal Queries:**
book availability
book ID
member fees
member contact information.
DVD availability
DVD ID
Purchase history

Printer points remaining

**Update Operations:**
Book is checked out
Changing member status
Adding new books to the catalog
DVD is checked out
Book is checked in
DVD is checked in
DVD is purchased
Book is purchased

**Different Views:**
Members Views: Members will be able to access to their Membership Status,personal Information and late fees, Can view books and DVD information and availability,, can view their check out Items History, can view their printer points and computer times they have left, and can also see their purchase's history.

Admin Views: When Login, the admin will have the ability to change the Member's Member Status, can add and remove a member's late Fees, can change the Member's Printer Points and Computer's Time, can change a Books availability, and can process purchases of items in the library. They can also see the purchase history of the Member's

**Integrity Constraints:**

There has to be a unique Book ID consisting of numbers for varying editions of the books. There must be an unique member ID consisting of a 10 digit alphanumeric string. There must be a unique DVD ID consisting of numbers. Purchases must have an item ID. Printer points must have a numeric value.

**User Constraints:**

Customer/member: Find a book, check book availability, check out a book, pay fees, see own due dates, see printer points and computer time, buy DVDs and Books. They would be a casual database end user.

Staff members: Find a book, check book availability, check books in, see and edit fees, see and edit due dates, see member contact information. They would be a database administrator.

**Schema Diagram:**

MEMBER BASIC INFORMATION

| Member_ID | Last_name | First_name | Email_address | Phone_number | Fees |
|---|---|---|---|---|---|

MEMBER STATUS INFORMATION

| Member_ID | Member_status | Member_Rank | Date_Added | Date_Left |
|---|---|---|---|---|

PRINTER_POINTS

| Member_ID | #_Of_Points | Refresh Date |
|---|---|---|

DVD

| DVD ID | Title | Genre | Price |
|---|---|---|---|

BOOK AVAILABILITY

| Book_ID | Total_Copies | Num_Checked_out |
|---|---|---|

BOOK INFO

| Book_ID | Author_ID | Book_Title | Genre | Section | Publisher | Price |
|---|---|---|---|---|---|---|

COMPUTER_TIME

| Member_ID | Amount_of_time | Refresh_date |
|---|---|---|

AUTHOR INFO

| AUTHOR_ID | Country | Author's_last_name | Author's_first_name |
|---|---|---|---|

PURCHASES

| Order_Num | Member_ID | Item_ID | Date_Purchased |
|---|---|---|---|

CHECKED_OUT_ITEMS

| Item_ID | Member_ID | Checked_out_date | Checked_in_date | Due_Date |
|---|---|---|---|---|

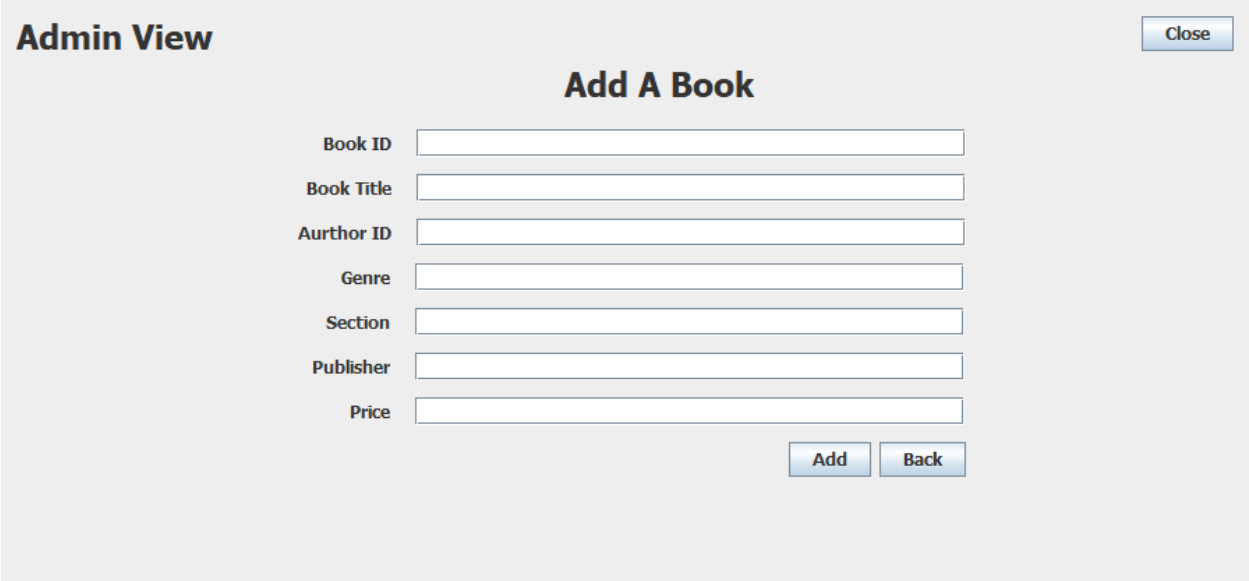
**DBMS Architecture**

We will use a three-tier DBMS architecture for our project. We chose this to hide data from clients such as other member's information.
The others are bad because they allow the client to have too much access to the database itself. One tier does not even offer an application interface for users.

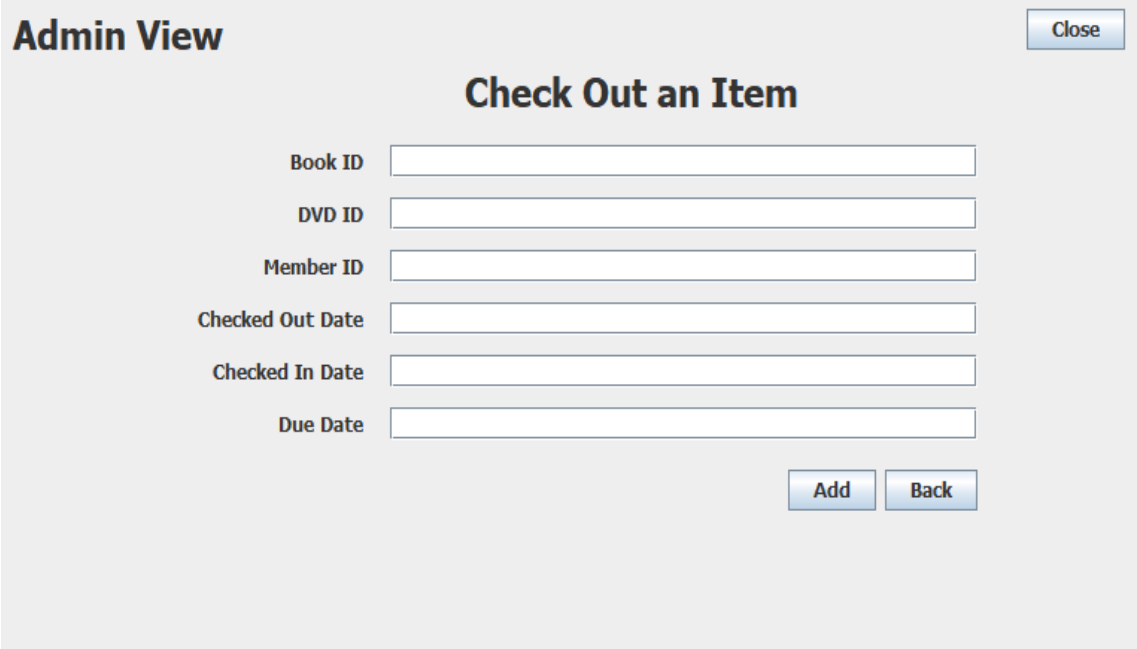
**Unique Columns:**

The ID columns (Book ID, Author ID, Member ID, Item ID and DVD ID) we used were all unique. The Order Number is unique as well.

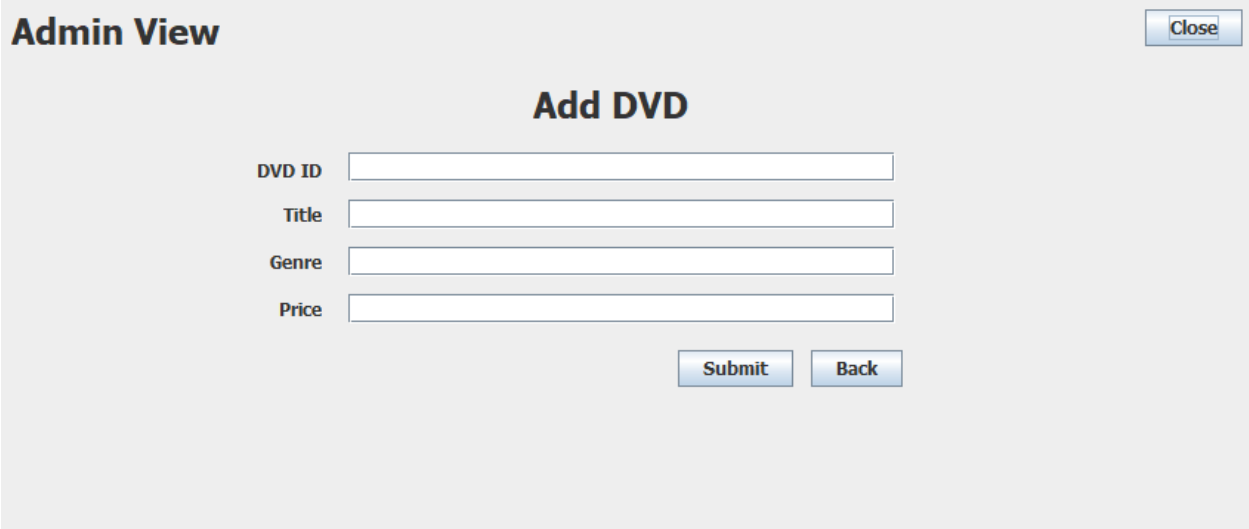
**Forms/Reports:**
**Add A BOOK FORM:**
Adds another book to the database



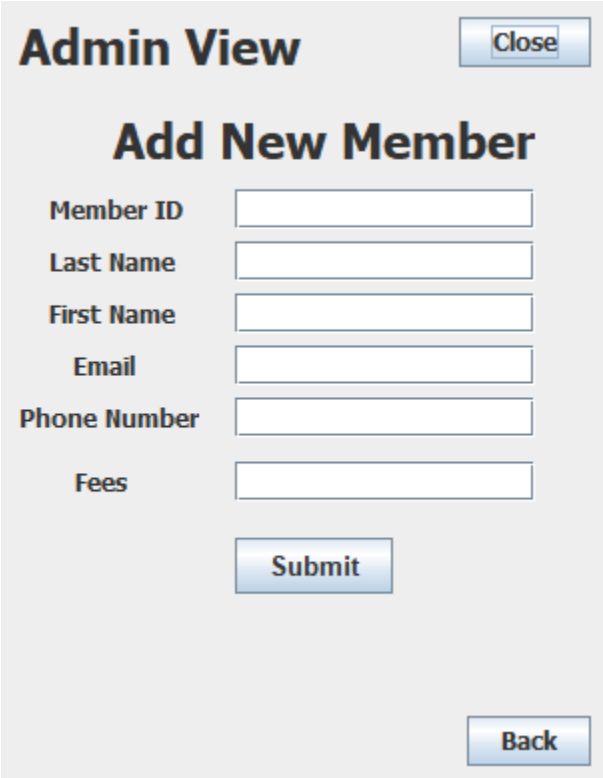
**Check Out Item Form:**
Adds another checked out item to the database



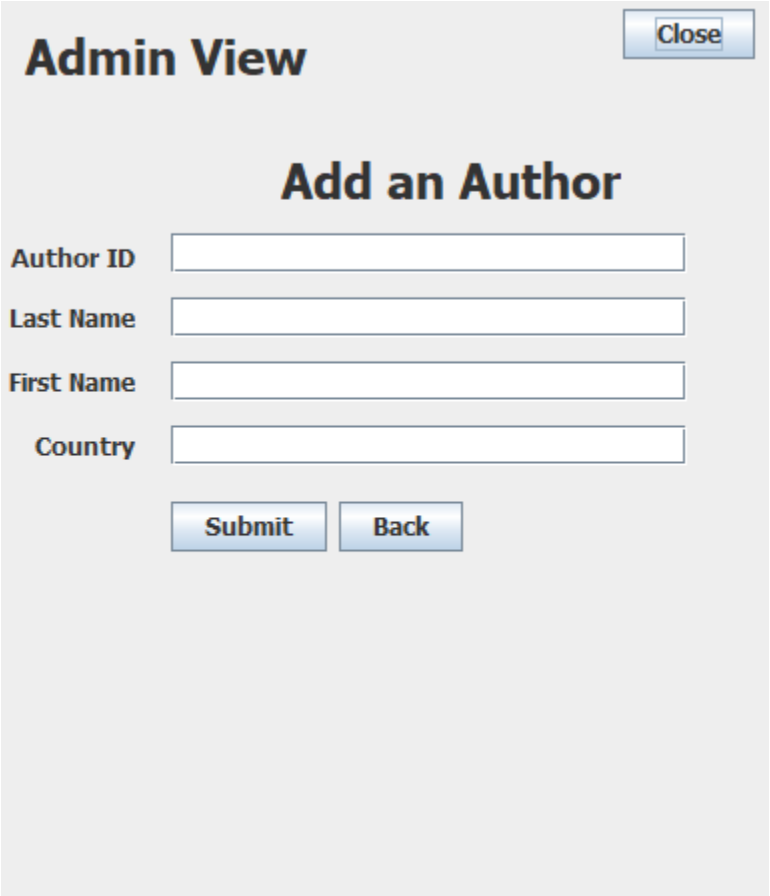

**Add A DVD FORM:**
Adds a DVD to the database



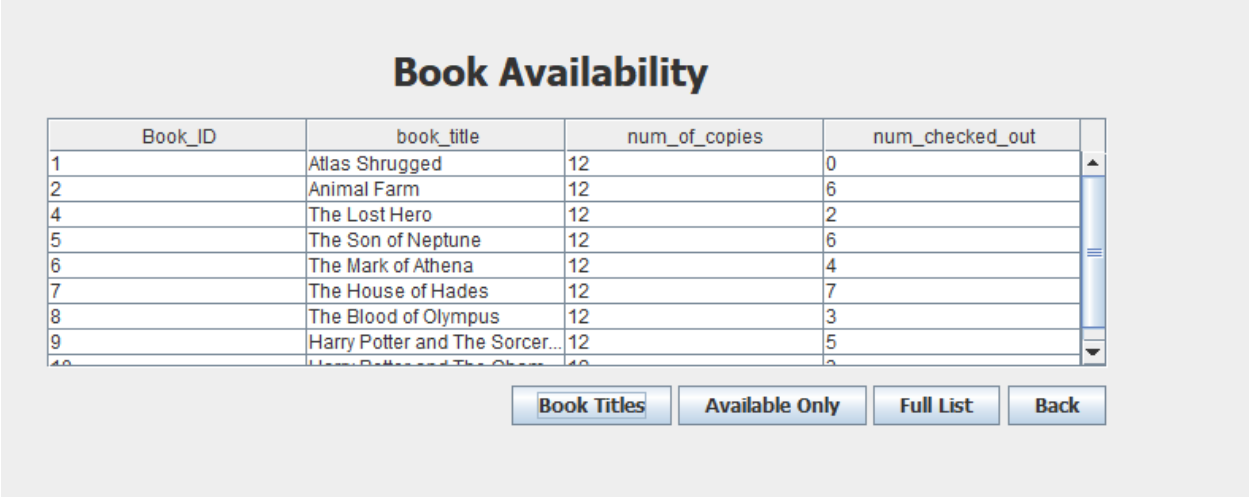
**ADD A Member FORM:**
Adds a Member to the database



**ADD an Author Form:**
Adds an Author to the database

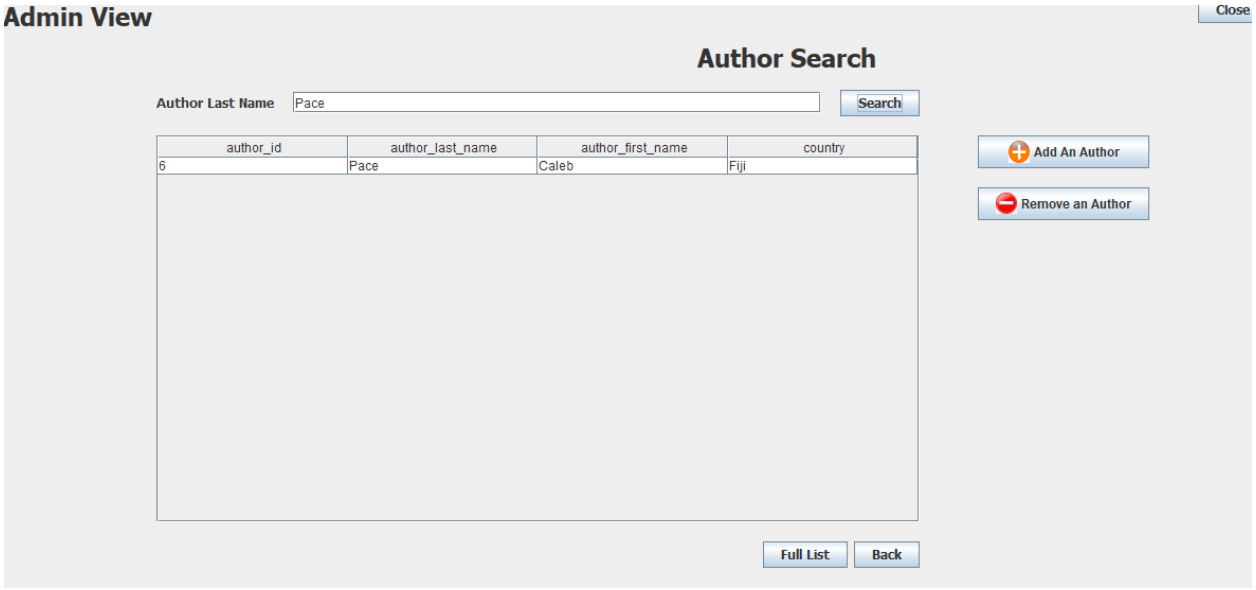



**Book Availability REPORT:**
Shows all books, their titles, the number of copies and the number available



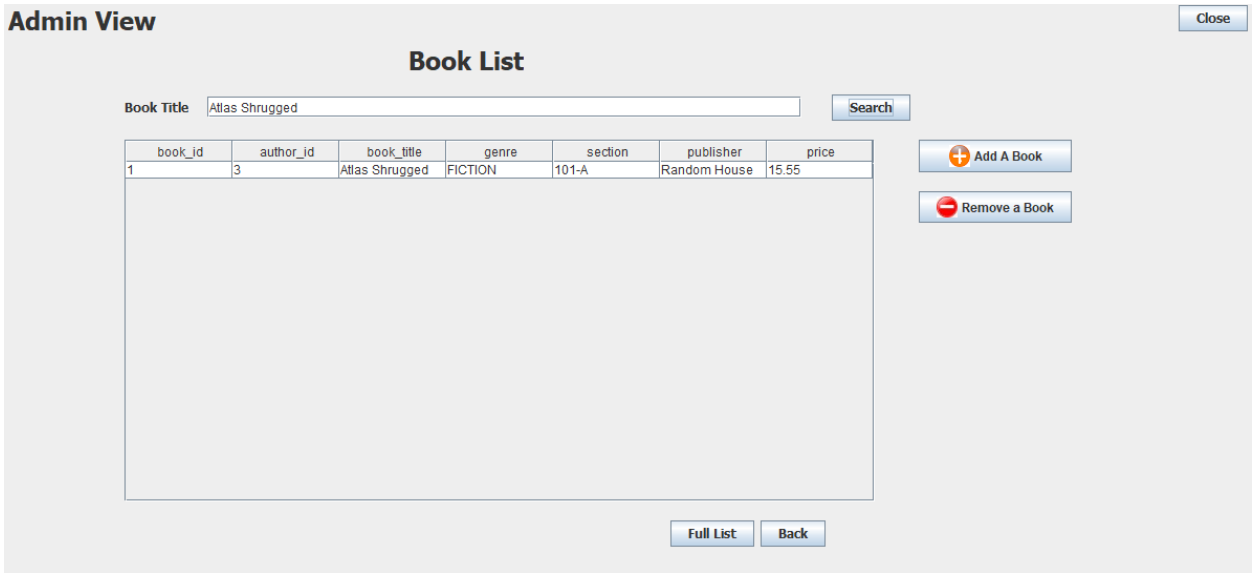
**AUTHOR QUERY:**

Searches the database for an author with the matching last name.



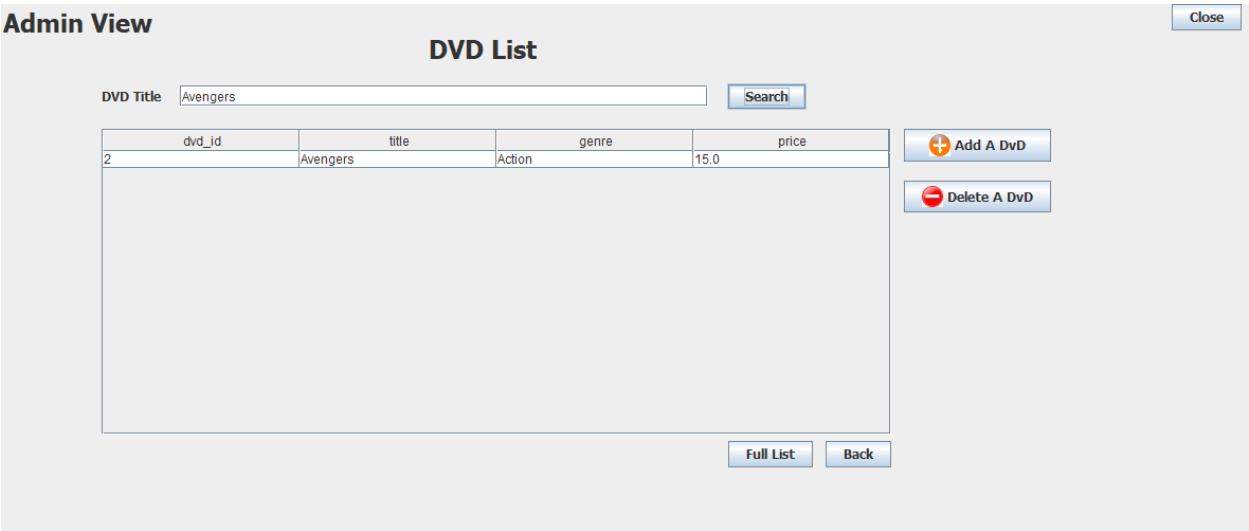

**BOOK TITLE QUERY**

Searches the database for a book with the matching title



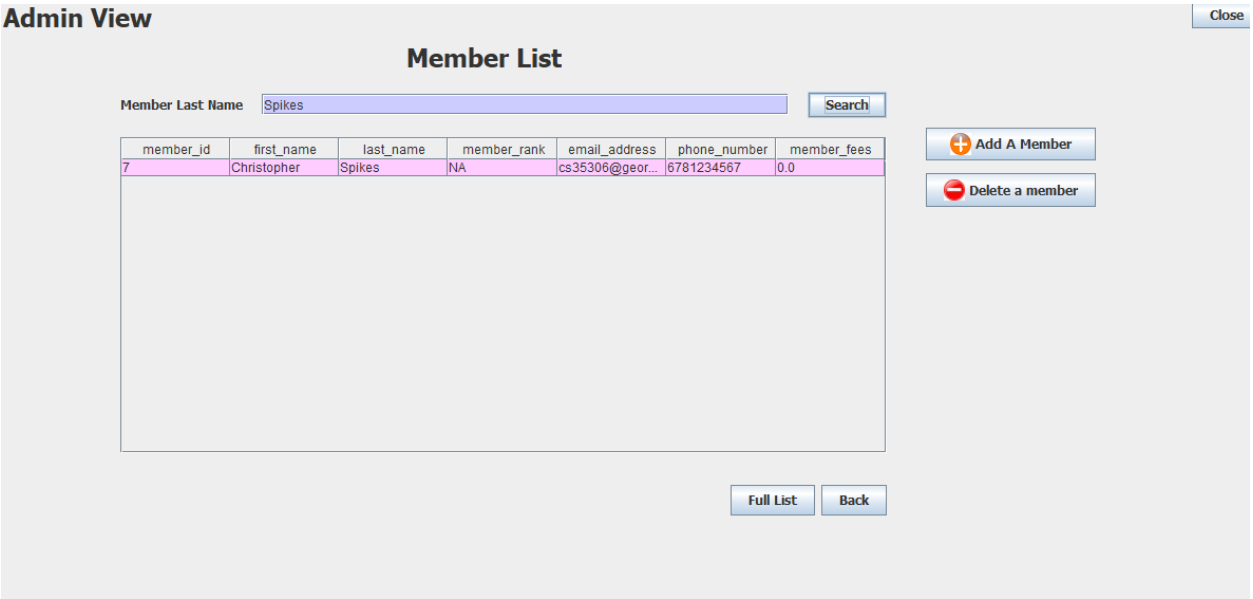
**DVD LIST QUERY**

Searches the database for a DVD with the matching title



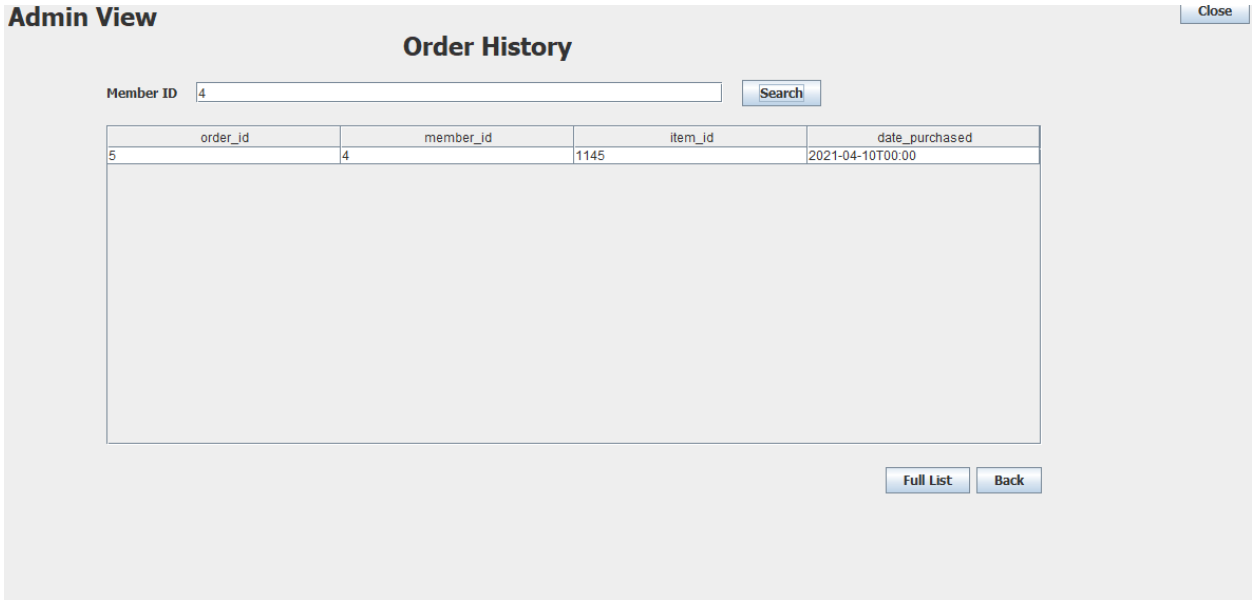

**MEMBER QUERY**

Searches the database for a member with the same last name

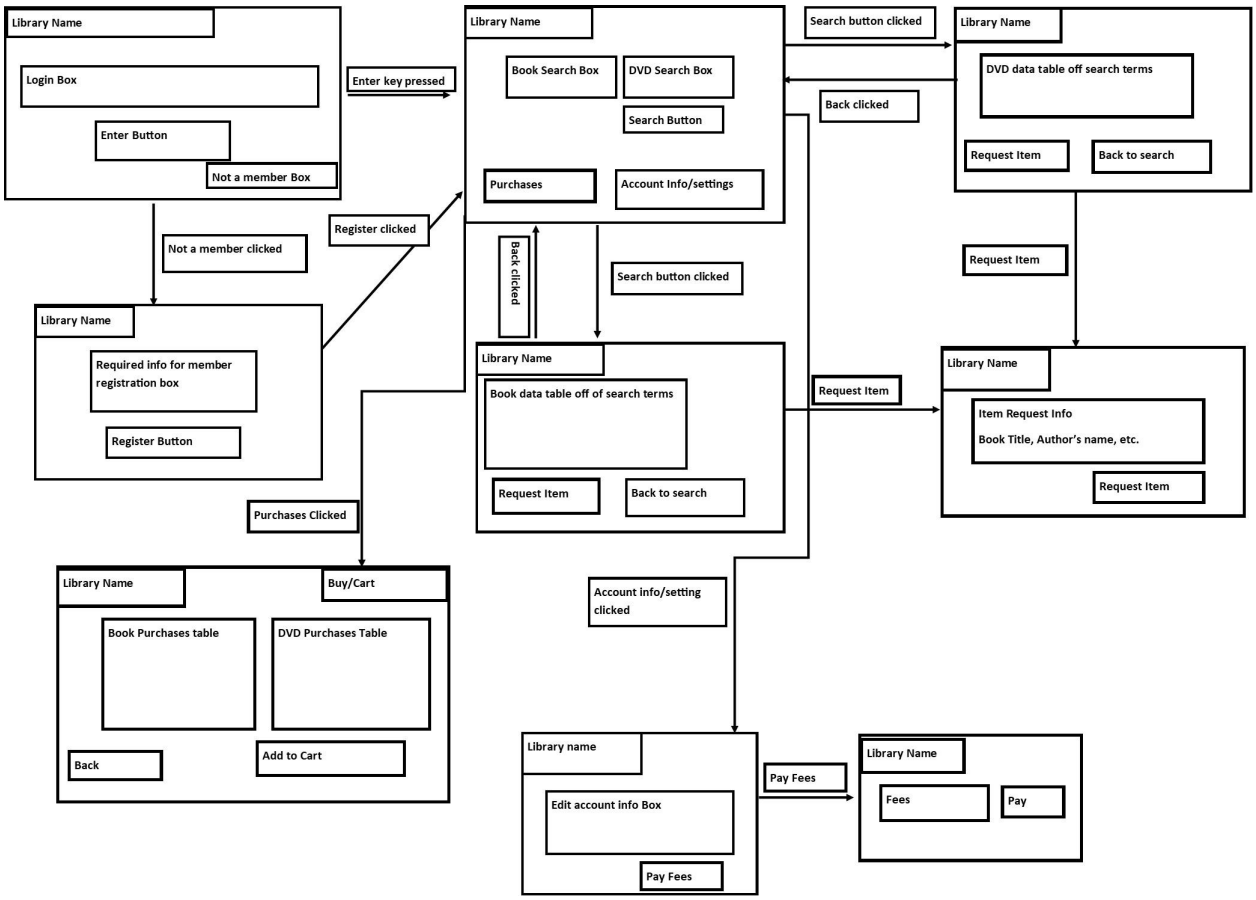


**ORDER HISTORY QUERY:**

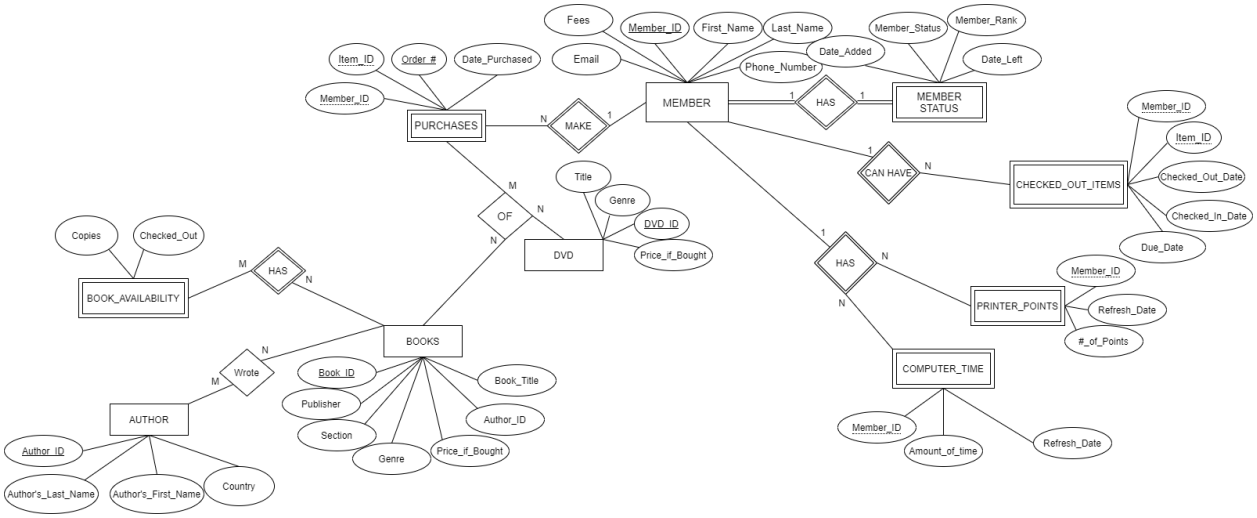
Searches the database for an order made by a member with a matching ID



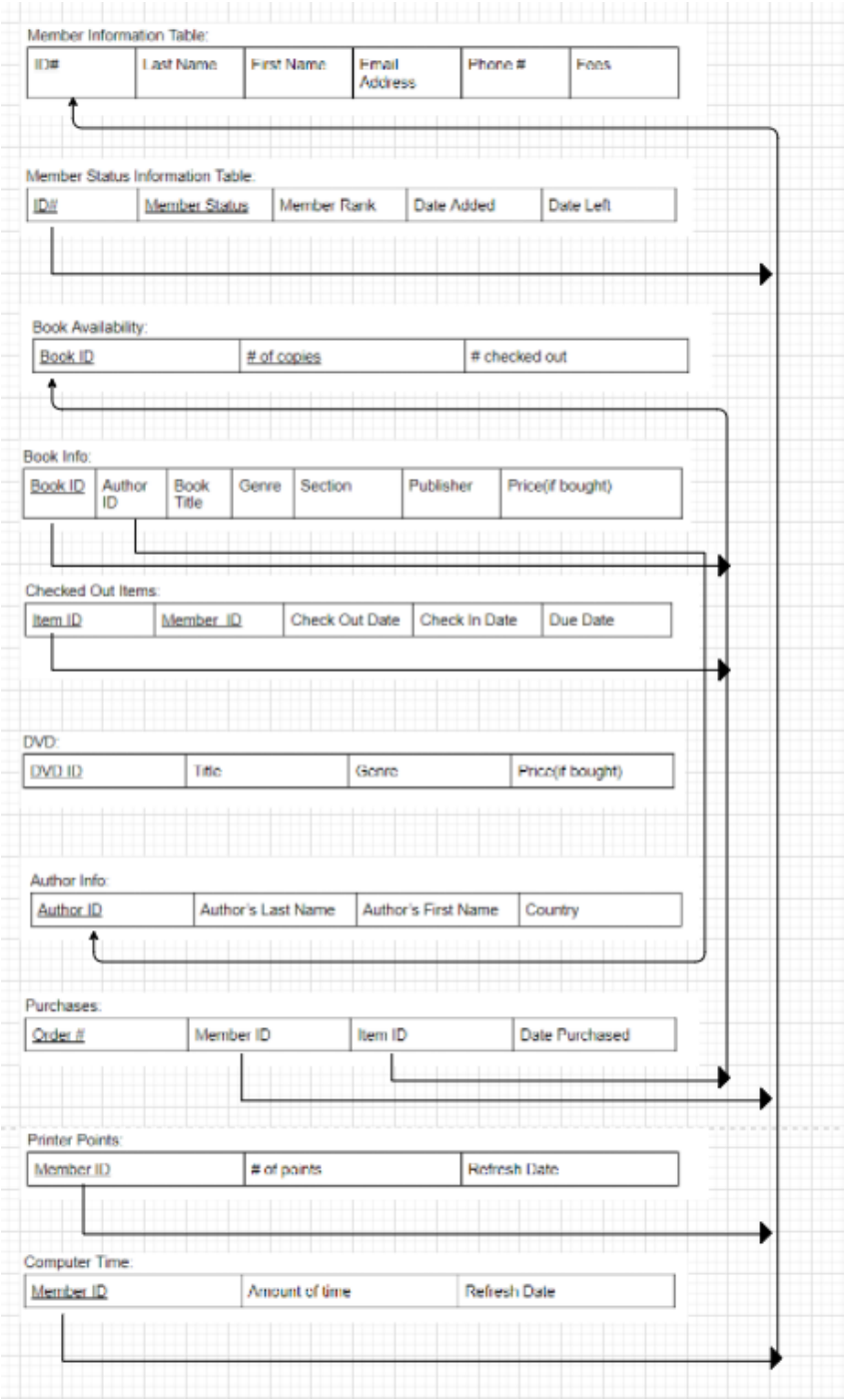
## Wire Sketch:




## ER Diagram:




**Relational Schema:**



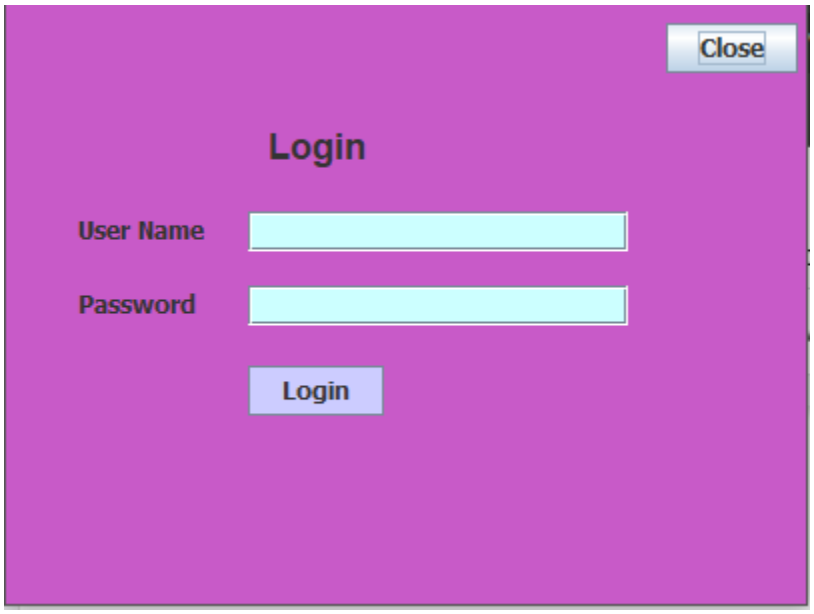

**Implementation Guide:**

1. Be sure that your preferred operating system is installed
2. With your preferred operating system installed go to MySQL :: Download MySQL Installer and install the corresponding Installer for your Operating System.
3. Go to Download Java for Windows and install the most recent version of Java for your operating System.

4. In The My SQL Workbench Application create a server that uses local host with the username “root” and the password “SN1P3R5500”.
5. Open the My SQL Command Line Client.
6. Enter the Password “SN1P3R5500”
7. Create the database media using the command “CREATE DATABASE media;”
8. Then Copy the entire SQL code from this document and paste it into the My SQL Command Line Client twice to ensure all tables are created correctly.
9. Download the .Jar file attached to the document and run it.

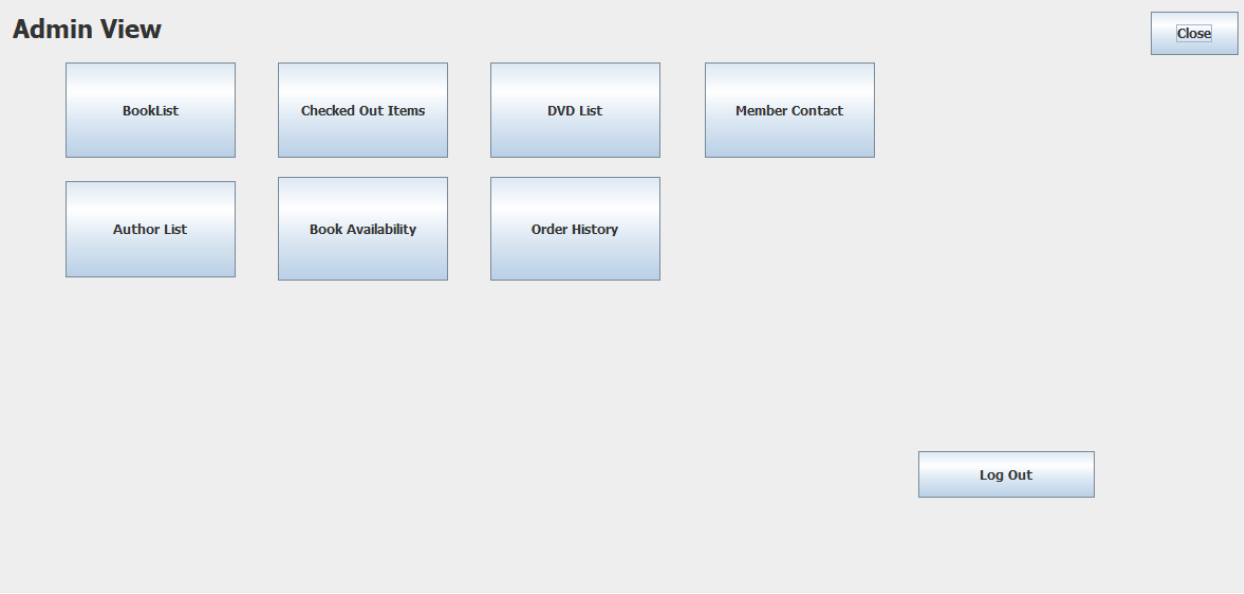
**USER MANUAL:**

1. Run the .JAR file titled Sql_Project.
2. You should see a screen that looks like this:

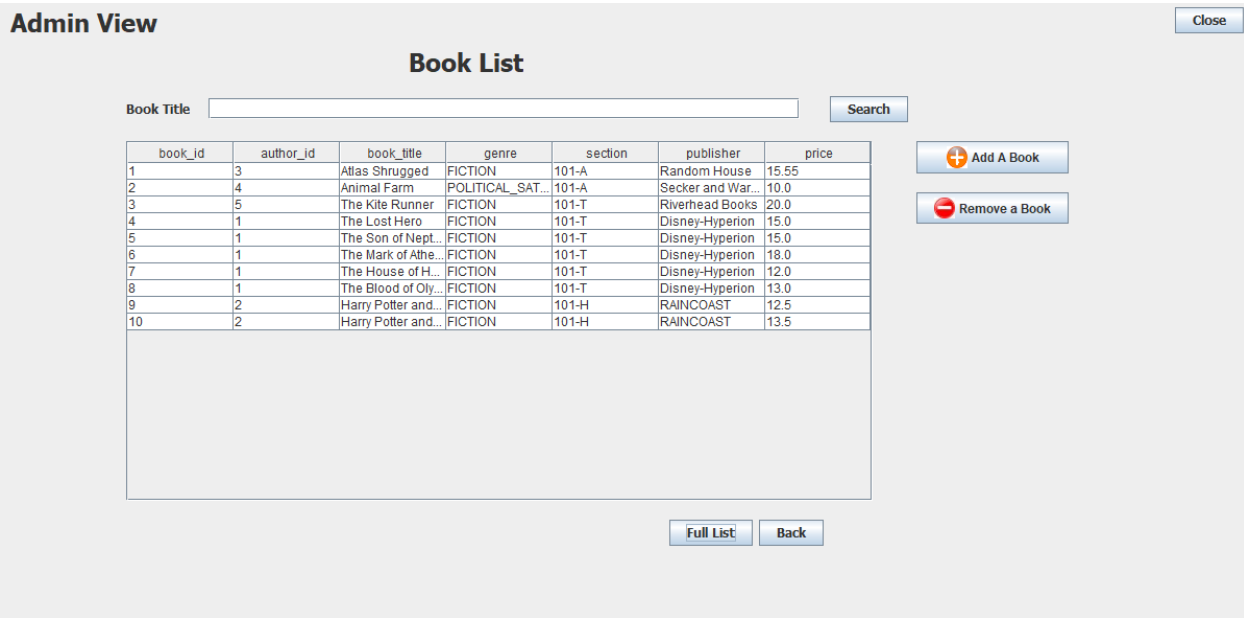



3. For the User Name input “admin” and the password input “admin” for the admin view

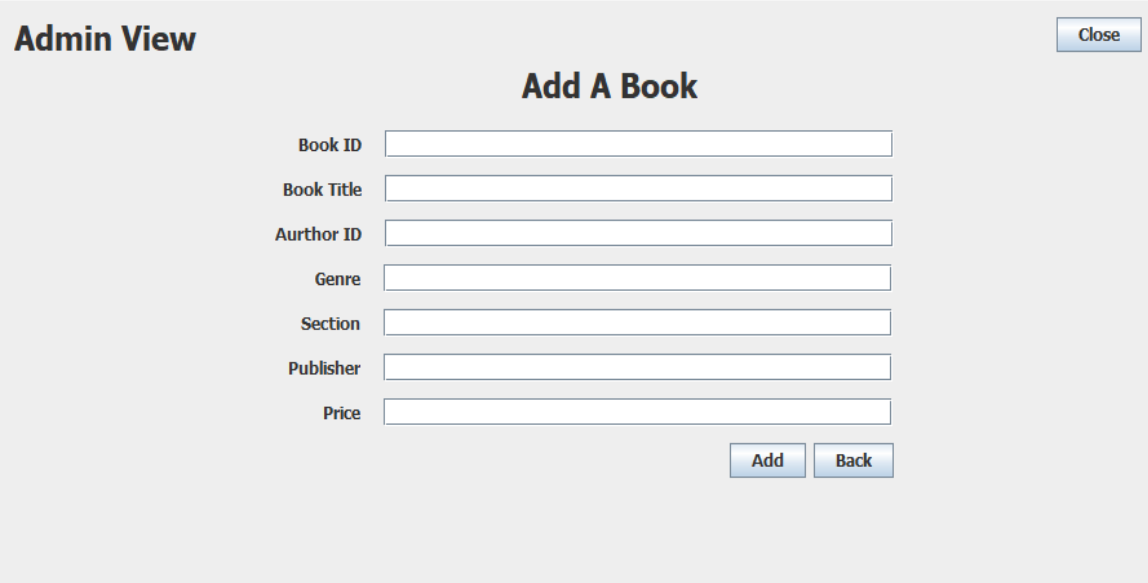
a. This display is shown:




b. To see the info about the books in the library as an admin Click on the BookList button and be taken to this screen:



i. Click Add a Book to add a book to the database. It will take you to this form:

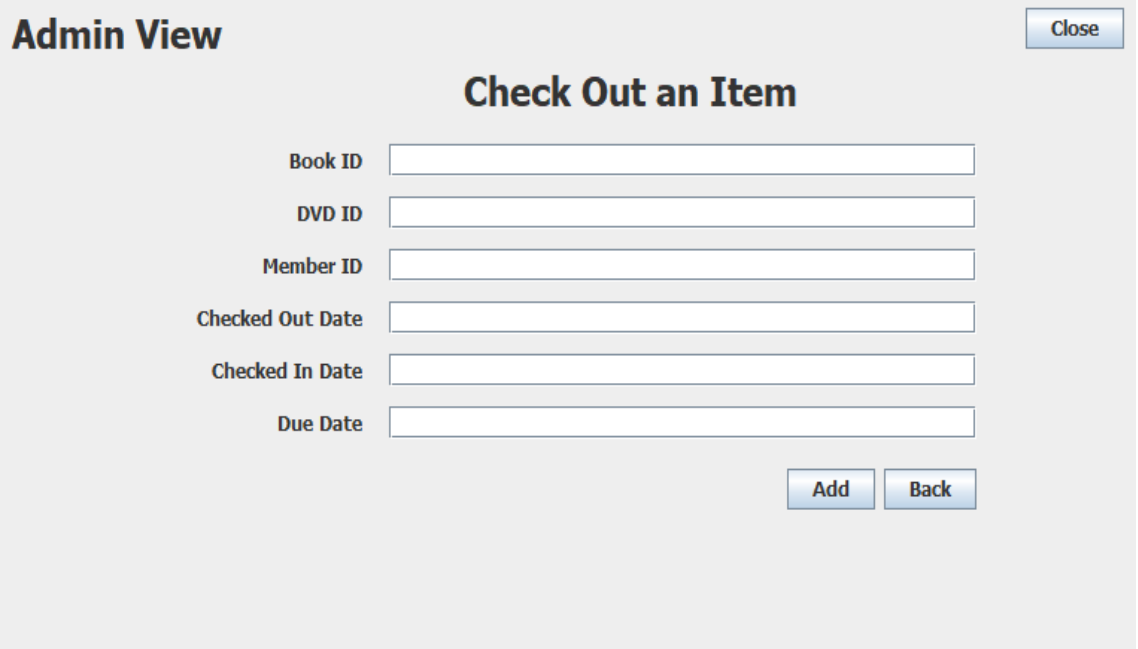



ii. Either enter in a new book, or hit the back button to return to the book list.

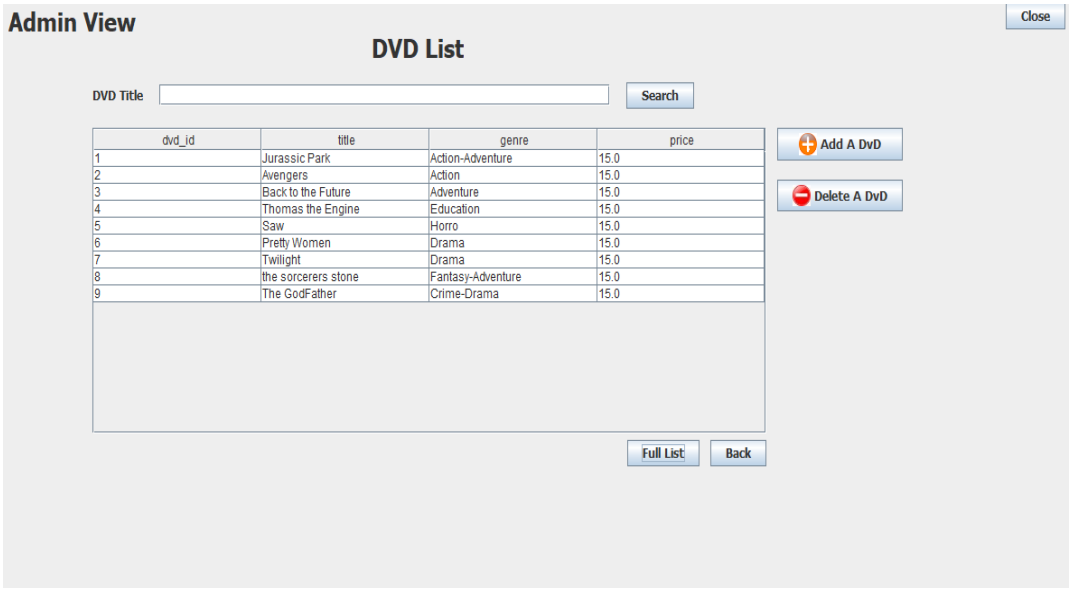
iii. To remove a book select in the table the book to delete, then hit the Remove a book Button.

c. Click the checked Out items to see the Check Out an Item Form:

i.

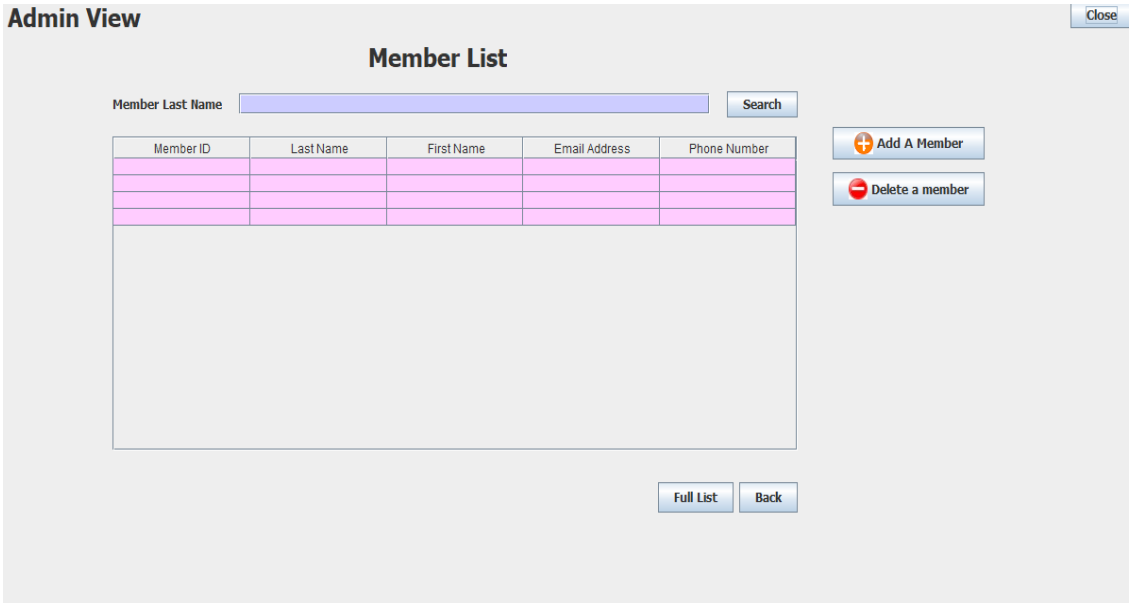



d. Click DVD List to see all DVD's in the library:

i. 


ii. Buttons work the same way that they do for Book List

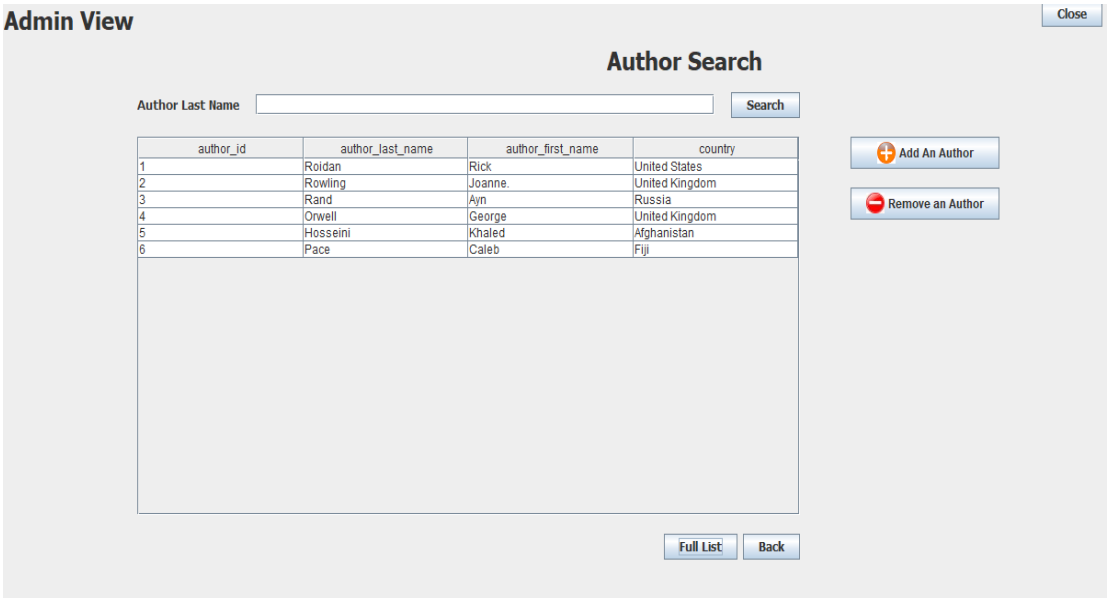
e. Click the Member Contact button to see the Member List

i. 


ii. Buttons work the same way that they do for Book List

f. Click the Author List button to see the Author List:

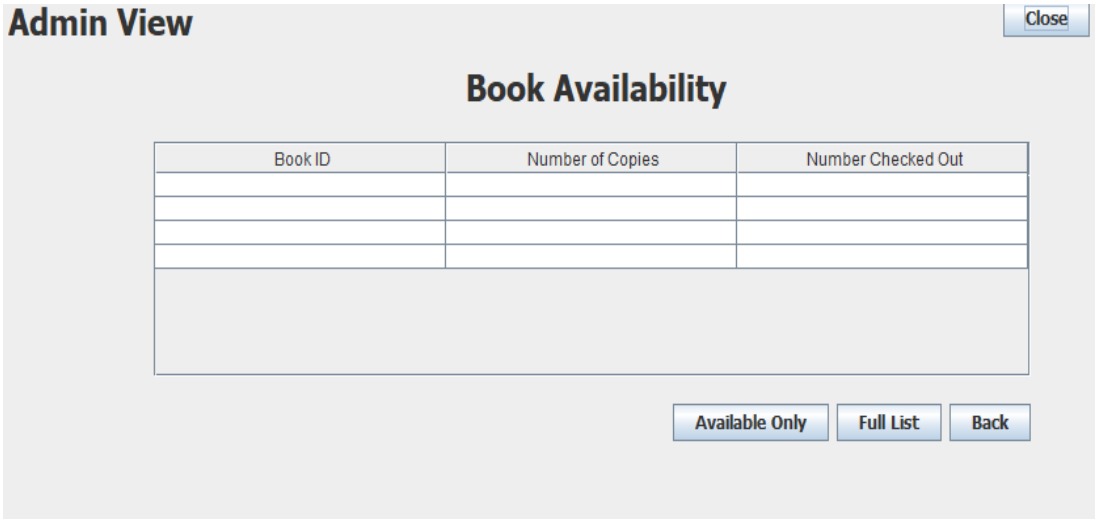
i.



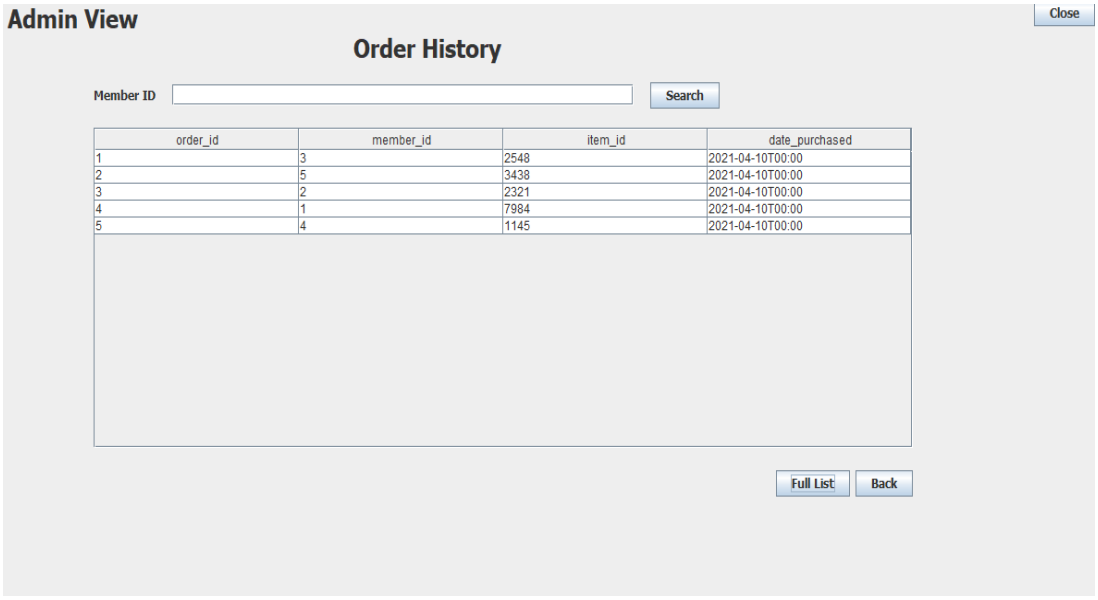

ii. Buttons work that same as Book List

g. Click the Book Availability button:

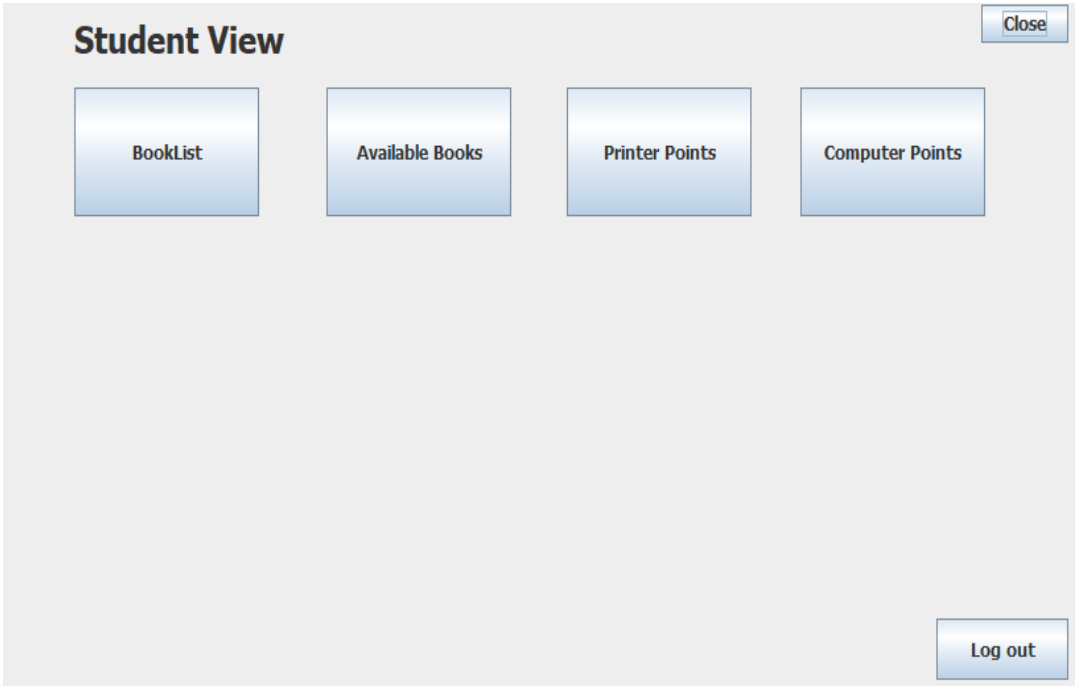
i.



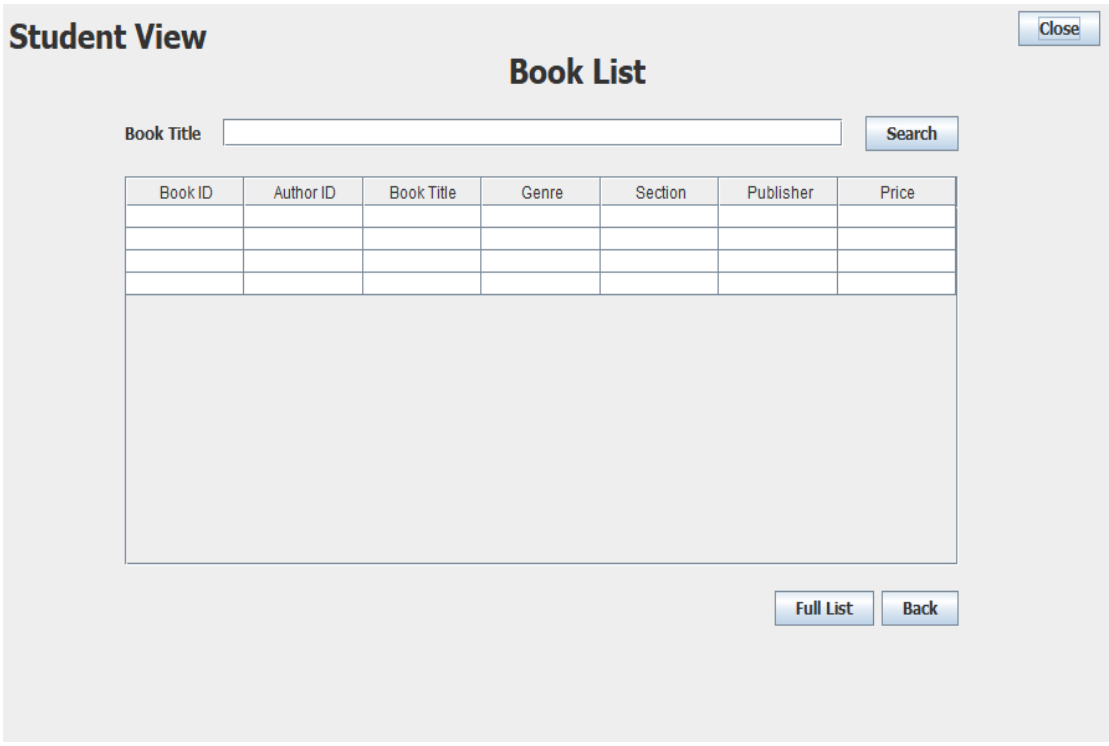

h. Click the Order History button:

i. 


4. Enter “student” for the Username and password for the login.
    a. You will be taken to the student View

i. 

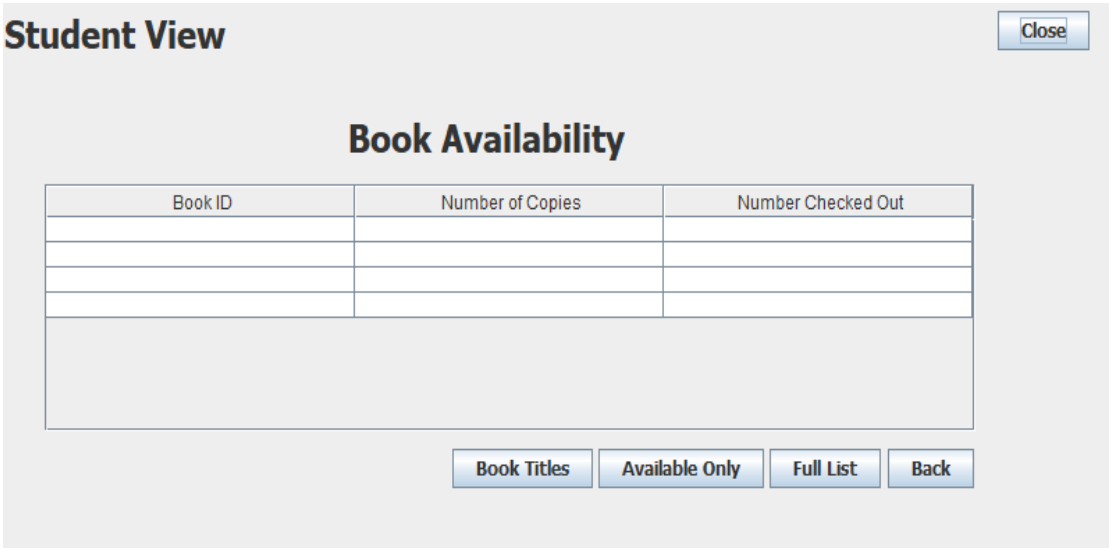

    b. Click Book List to see the Student View Book List




i.

ii. Click Full List to see all books that the library has

c. Click available Books to see all available books and the number of copies in the library:

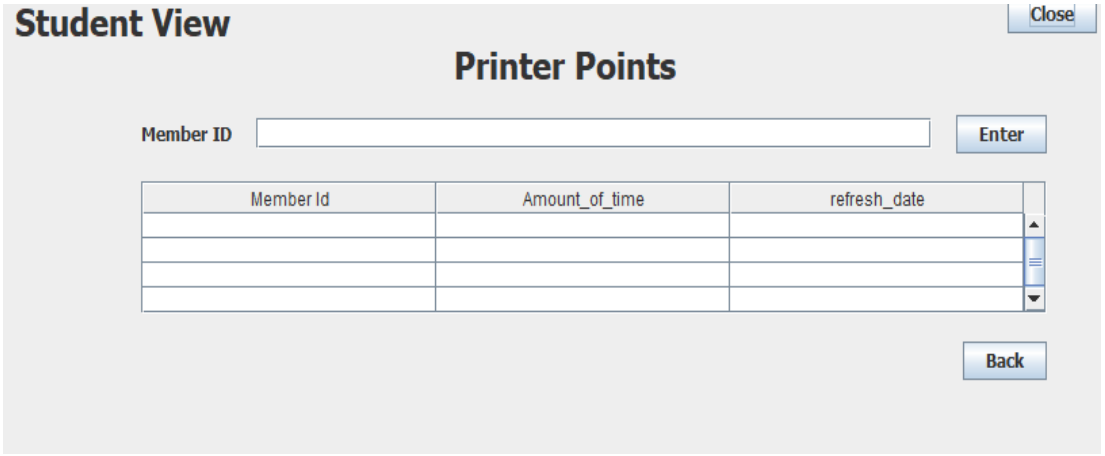



i.

ii. Click book Titles to see all available books and their titles

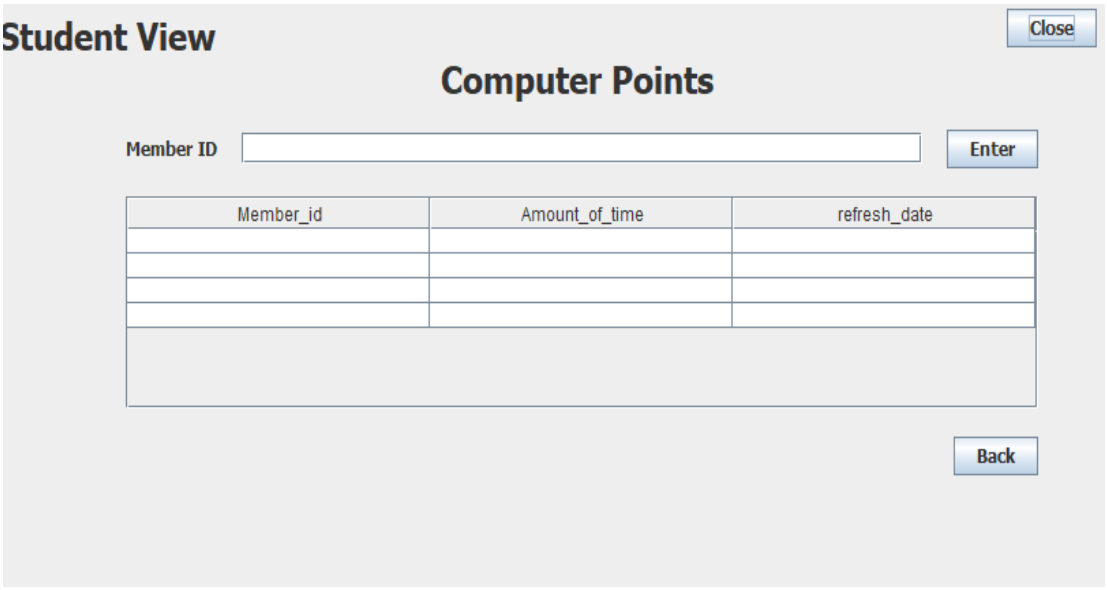
iii. Click available books to see the available books only

d. Click Printer points to see the printer points window:

i. 


ii. Enter your Member Id to see the amount of printer points you have left

e. Click Computer Points to see this window:

i. 


ii. Same instructions for printer points

5. Hit logout to logout of the current view, or close to exit the program.

**Narrative Conclusion:**

**Did you achieve whatever you planned in your project? If you have drifted from the original plan, why did that happen? How has your project evolved over time?**

- For the most part we achieved what we wanted to achieve. The project did not evolve much, if at all, over time.

**An assessment on the quality of your project. Feel free to discuss what parts of your project you felt are particularly strong and what parts would need more work to bring up the quality**

- Overall our project is very well done. A couple of strong parts of the project is the implementation of the UI and the implementation of the SQL. A couple of weak parts of the project is the design of the UI(none of us are experienced in this area) and the login system is very barebones.

**Each team member's individual experience by doing this project:**

- **Stephen Barnhart:**

  **Which parts were the most fun?**

  I enjoyed learning how to use and implement SQL and learning how to hook up SQL and JavaFx.I also enjoyed being the team lead and learning how to play that role.

  **Which parts were the most challenging? How did you solve those challenges?**

  The most challenging part of the project was actually the project itself, it was getting all 5 group members to meet at the same time since everyone has different schedules. In regards to the project the most challenging part for me was trying to learn and implement the SQL language at the same time.

  **Which parts were the easiest?**

  The easiest part of the project was working with the group members. Everyone did their job in a timely manner which made the project much easier.

  **What did you learn that you did not imagine you would have?**

  I learned how to link up javaFx and SQL together which going into the project, I did not expect to have to learn how to do that.

  **If you had to do it all over again, what would you have done differently?**

  If I had to do the project all over again I would have definitely started the coding part earlier and I would have better organized mine and my team's time better towards the end of the project.

  **What is your overall experience of working in a team?**

  Overall working as a team made this project much easier and it also made the project more fun to complete.

- **Ezekiel Maynard:**

  **Which parts were the most fun?**

  I enjoyed the creation of the Java FX GUI and attaching it to the mySQL.

  **Which parts were the most challenging? How did you solve those challenges?**

  The most challenging part of this project was learning how SQL worked and the different commands that it can do. Also making the GUI look how we wanted it to.

**Which parts were the easiest?**
The easiest part of this project was the Java GUI since i have experience with java FX and J Frames.

**What did you learn that you did not imagine you would have?**
I learned how to make my sql and a java program work together, and how easy it can be to miss it up.

**If you had to do it all over again, what would you have done differently?**
I would have started the SQL implementation earlier and picked a different group member than Joshua.

**What is your overall experience of working in a team?**
Overall, working with a group made this project simpler and easier to understand than it could be. It also made it easier to complete bigger goals in a timely manner.

- **Caleb Pace:**

**Which parts were the most fun?**
I had the most fun making the tables and coming up with ideas for the diagrams and schemas.

**Which parts were the most challenging? How did you solve those challenges?**
The most challenging part for me was writing the SQL code for updates and triggers because I had never written SQL before. To solve this problem I watched the examples in class and read some guides and examples online. Then trial and error.

**Which parts were the easiest?**
The easiest part was getting everyone to make their own tables and show up to the meetings for meaningful discussion.

**What did you learn that you did not imagine you would have?**
I did not learn anything that I wasn't expecting too when this project started.

**If you had to do it all over again, what would you have done differently?**
I would have started coding when we were working on the relational schema, so that the final product would be more refined. That way we could add in more of the ideas we had in the beginning to the final product.

**What is your overall experience of working in a team?**
Working as a team alleviated the stress of having to verify every line of code myself. It also helped make the project more fun and efficient.

- **Alexis Jones:**

**Which parts were the most fun?**
I had the most fun coming up with the idea for this project and making all of the diagrams and tables. Also being a part of this group has been pretty enjoyable.

**Which parts were the most challenging? How did you solve those challenges?**

I would say the hardest part for me would have to be managing this project in time with all the other projects that I had going on this semester. Seeing that this group had largely different schedules it was hard to get everyone together every week at the beginning of this project. I was able to handle these issues by making sure I was able to meet the deadlines set for my group early so I wouldn't be overwhelmed, and that we decided very early on what day and time we should meet, so we wouldn't have to keep asking.

**Which parts were the easiest?**

The most easiest part was coming up with the tables and making the ER diagrams

**What did you learn that you did not imagine you would have?**

Learning how to use MySql and SQL in general, seeing as I didn't even know that SQL even existed.

**If you had to do it all over again, what would you have done differently?**

I would've started the coding way early in the semester and finished things before the deadline way early in advance.

**What is your overall experience of working in a team?**

Overall I really enjoyed working with this team on this project. They are a bit crazy, but they get their work done and can have a few laughs about it as well.

- **Josh Lee:**

**Which parts were the most fun?**

It was fun seeing everything come together and how everybody worked together to reach the final product.

**Which parts were the most challenging? How did you solve those challenges?**

The hardest part for me was time management. I had another product this semester and it was hard keeping track of my responsibilities for both groups. I solved it by trying to complete what I needed to as soon as I could so everything wouldn't pile up on me.

**Which parts were the easiest?**

The easiest part was working with my group members. It was fun getting to know everybody and working alongside them. Everybody was nice and did what they had to do to complete the project.

**What did you learn that you did not imagine you would have?**

How to write SQL statements and how to use the MySQL workbench.

**If you had to do it all over again, what would you have done differently?**

I would manage my time better through the course of the project. The deadlines creeped up on me extremely fast.

**What is your overall experience of working in a team?**
Overall it was fun. My team members made the project fun and I learned a lot from all of them.

**Future Work:**

- An actual login system
- Better UI design
- Track and manage member fees
- Make more processes automatic through the use of more triggers
- Order Forms for members