

(a) User manual

1. The program starts off with asking for username and password. If not entered correctly, it will ask you again until you enter the correct credentials.

```
Enter your username: wrong
Enter your password: bad
java.sql.SQLException: Access denied for user 'wrong'@'localhost' (using password: YES)
Enter your username: █
```

2. You enter correct credentials and shows you the menu of program features

```
Enter your username: root
Enter your password: mysql123

Select an option below.
(a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
(b) Retrieve for a book first, middle and last names of its authors.
(c) Retrieve ISBN, title and barcode of every book copy.
(d) Retrieve card number, first, middle and last name of every member.
(e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
(f) Register in the system the return of a book a chosen member borrowed.
(g) Borrow a book copy to a chosen member.
(h) Renew a loan of a book copy to a chosen member.
(i) Retrieve how much money a chosen member owes to the library.
(j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
(k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
(q) quit
Enter a choice: █
```

3. You can choose any of the options but if option input is incorrect, it will keep pulling up the options menu.

```
Select an option below.
(a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
(b) Retrieve for a book first, middle and last names of its authors.
(c) Retrieve ISBN, title and barcode of every book copy.
(d) Retrieve card number, first, middle and last name of every member.
(e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
(f) Register in the system the return of a book a chosen member borrowed.
(g) Borrow a book copy to a chosen member.
(h) Renew a loan of a book copy to a chosen member.
(i) Retrieve how much money a chosen member owes to the library.
(j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
(k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
(q) quit
Enter a choice: A

Please enter a valid choice!

Select an option below.
(a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
(b) Retrieve for a book first, middle and last names of its authors.
(c) Retrieve ISBN, title and barcode of every book copy.
(d) Retrieve card number, first, middle and last name of every member.
(e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
(f) Register in the system the return of a book a chosen member borrowed.
(g) Borrow a book copy to a chosen member.
(h) Renew a loan of a book copy to a chosen member.
(i) Retrieve how much money a chosen member owes to the library.
(j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
(k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
(q) quit
Enter a choice: █
```

4. Now, you can choose any of the options presented and if you choose 'q', then the program ends. Some of the options will ask for additional information which there will be a menu to choose from. For example:

Select an option below.

- (a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
- (b) Retrieve for a book first, middle and last names of its authors.
- (c) Retrieve ISBN, title and barcode of every book copy.
- (d) Retrieve card number, first, middle and last name of every member.
- (e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
- (f) Register in the system the return of a book a chosen member borrowed.
- (g) Borrow a book copy to a chosen member.
- (h) Renew a loan of a book copy to a chosen member.
- (i) Retrieve how much money a chosen member owes to the library.
- (j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
- (k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
- (q) quit

Enter a choice: f

330

331

332

333

334

Enter the card number of a member from the list of ALL members above: 335

Not in the list!

Enter the card number of a member from the list of ALL members: 333

1100

1101

1102

1103

1104

1105

1106

1107

1108

1109

1110

1111

1112

1113

1114

1115

Enter the barcode of the book from the list of ALL book copies above: 555

Not in the list!

Enter the barcode of the book from the list of ALL book copies: 1100

[registered in the system the return of a book copy (1100) to a chosen member (333) borrowed]

(note that the input has to be 1 value from the unique card_no from MEMBER table and unique barcode from the COPY table for fail safe reasons such as updating or inserting members that do not exist)

(b) Implemented and not implemented functionality

Implemented: the menu function, menu within a menu for fail safe purposes, manages functions 'a-k' and 'q', and accounted for incorrect inputs for every user inputs.

Not implemented: for the functions that involve insert or update, when user inputs barcode (book copy) or card_no that does not exist in the database, it doesnt create new members and brand new book copies. It also does not account for only available book copies but all book copies when inserting or updating. Next, input scope only extends to card_no instead of other information such as last_name (because there may be members with same last name and different card_no). Also for "(b) Retrieve for a book first, middle, last names of its authors", ISBN can be searched instead of title or both, but only allowed user to enter the exact title of the book since ISBN are more difficult to remember but it may have drawbacks for different editions. Lastly, for "(h) Renew a loan of a book copy to a chosen member", if their book copy renewal_no is already a 2, it will stay 2 since it is the limit but it could return that they reached maxium.

(c) Assumptions made regarding issues that were not explicit

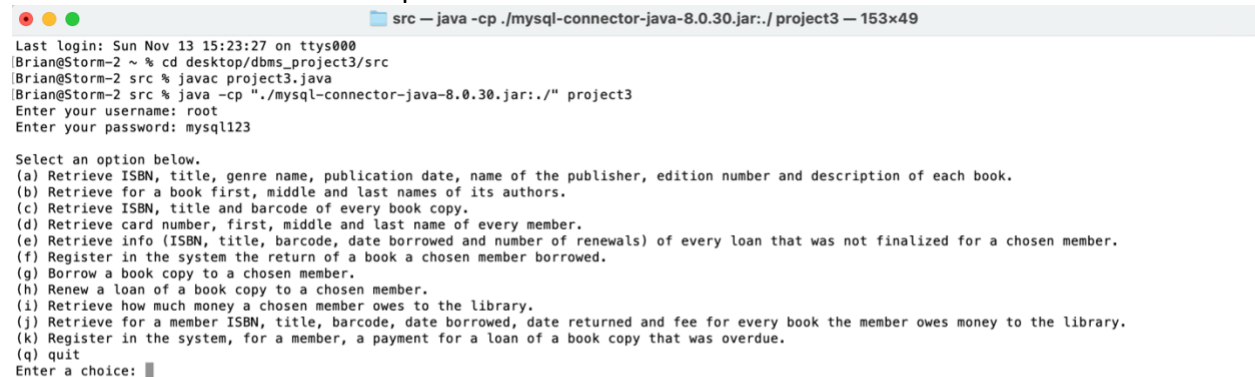
1. As mentioned in (b) as not implemented, the project prompt does not explicitly state how to query information for a particular member, so I assumed and went with the primary key: card_no (which has to be unique for every different kind of members) for user input.
2. As mentioned in (b) as not implemented, retrieving authors of a book could have been done by accounting for title and ISBN but assumed title for easier input. Also assumed that newer editions of the book mostly include the authors from the previous edition so it would be fine.
3. Assumed for options that update or insert, it would be best to keep the scope of the input for existent members or book copies so there will not be any confusion.

(d) Info about how to build and run your project

FOR macOS or Linux

1. Make sure you have MySQL server installed and running on your system.
2. Make sure you have login credentials (username and password) to access MySQL server loaded with library schema and insert file that contain information of the database to query.
3. Download or have the project folder
4. Open up terminal and cd into where project3.java file is located.
5. Compile the program by typing 'javac project3.java'
6. Run the program by typing 'java -cp "./mysql-connector-java-8.0.30.jar:./" project3'

Here is the screen shot of the process



```

src — java -cp ./mysql-connector-java-8.0.30.jar:./ project3 — 153x49
Last login: Sun Nov 13 15:23:27 on ttys000
Brian@Storm-2 ~ % cd desktop/dbms_project3/src
Brian@Storm-2 src % javac project3.java
Brian@Storm-2 src % java -cp "./mysql-connector-java-8.0.30.jar:./" project3
Enter your username: root
Enter your password: mysql123

Select an option below.
(a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
(b) Retrieve for a book first, middle and last names of its authors.
(c) Retrieve ISBN, title and barcode of every book copy.
(d) Retrieve card number, first, middle and last name of every member.
(e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
(f) Register in the system the return of a book a chosen member borrowed.
(g) Borrow a book copy to a chosen member.
(h) Renew a loan of a book copy to a chosen member.
(i) Retrieve how much money a chosen member owes to the library.
(j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
(k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
(q) quit
Enter a choice: █
  
```

FOR WINDOWS

1. Make sure you have MySQL server installed and running on your system.
2. Make sure you have login credentials (username and password) to access MySQL server loaded with library schema and insert file that contain information of the database to query.

3. Download or have the project folder
4. Open up CMD and cd into where the project3.java file is located.
5. Compile the program by typing 'javac project3.java'
6. Run the program by typing 'java -cp "./mysql-connector-java-8.0.30.jar;./" project3'

Here is the screen shot of the process

```
Command Prompt - java -cp "./mysql-connector-java-8.0.30.jar;./" project3
Microsoft Windows [Version 10.0.19045.2251]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Titan>cd desktop\dbms_project3/src

C:\Users\Titan\Desktop\dbms_project3\src>javac project3.java

C:\Users\Titan\Desktop\dbms_project3\src>java -cp "./mysql-connector-java-8.0.30.jar;./" project3
Enter your username: root
Enter your password: mysql123

Select an option below.
(a) Retrieve ISBN, title, genre name, publication date, name of the publisher, edition number and description of each book.
(b) Retrieve for a book first, middle and last names of its authors.
(c) Retrieve ISBN, title and barcode of every book copy.
(d) Retrieve card number, first, middle and last name of every member.
(e) Retrieve info (ISBN, title, barcode, date borrowed and number of renewals) of every loan that was not finalized for a chosen member.
(f) Register in the system the return of a book a chosen member borrowed.
(g) Borrow a book copy to a chosen member.
(h) Renew a loan of a book copy to a chosen member.
(i) Retrieve how much money a chosen member owes to the library.
(j) Retrieve for a member ISBN, title, barcode, date borrowed, date returned and fee for every book the member owes money to the library.
(k) Register in the system, for a member, a payment for a loan of a book copy that was overdue.
(q) quit
Enter a choice:
```