The following are the tables used in the Library management system:
Tables:

1.Users:

This is the user table that holds the information about all the valid library users. Each user has a unique userID.

Primary Key - (userID **)**

- ➢ userID (Primary Key)
- ➢ Name
- ➢ password
- ➢ address
- ➢ profession

2.Librarians:

This holds the information about all the librarians who manage the library. They have a unique LibrarianID.

Primary Key - (librarianID **)**

- ➢ librarianID
- ➢ Name
- ➢ Password
- ➢ address

3.Books:

This table contains the information about all the books that are available in the library along with the information of the book.

Each different book has a unique ISBN number and all similar books have different copy number

Primary key - (ISBNnumber , copyNo **)**

Foreign Key - (shelfId from table shelf**)**

- ➢ ISBNnumber
- ➢ copyNo
- ➢ Title
- ➢ Publication_year
- ➢ shelfID
- ➢ current_status

4.Authors:
This has the information related to authors like authorID, their names and a little of description related to their works.
Primary Key - (authorID**)**

- ➢ authorID
- ➢ name
- ➢ details

5.Book_authors:
This table is a relational table for the books and authors. It contains the bookID and AuthorID, gives us information about the authors of each book.
Primary Key - (bookID , authorID**)**
Foreign Key - (bookID from books table, **authorID** from authors table**)**

- ➢ bookID
- ➢ authorID

6.Shelf:
This table accounts for the information related to shelves containing books, for instance the capacity of a shelf,shelfID etc..
Primary Key -(shelfID)

- ➢ shelfID
- ➢ capacity
- ➢ shelfcol

7.Ratings&Reviews:
This holds the ratings and reviews of the books including the information of the book being rated/reviewed and the user performing the action.
Primary Key - (user_ID,book_ID)

- ➢ user_ID
- ➢ book_ID
- ➢ Rating
- ➢ review

8.PersonalBookShelf:
This is the list of users and the books they added to their personal bookshelf.
Primary Key - (user_id, book_id **)**
Foreign Key - (user_id from user table, book_id from book table**)**

- ➢ user_id
- ➢ book_id

9.Category:
This table contains all the categories which are available in the library
Primary Key - (Category_name, book_id **)**
Foreign Key - (book_id from books table **)**

- ➢ bookISBN
- ➢ Category_name

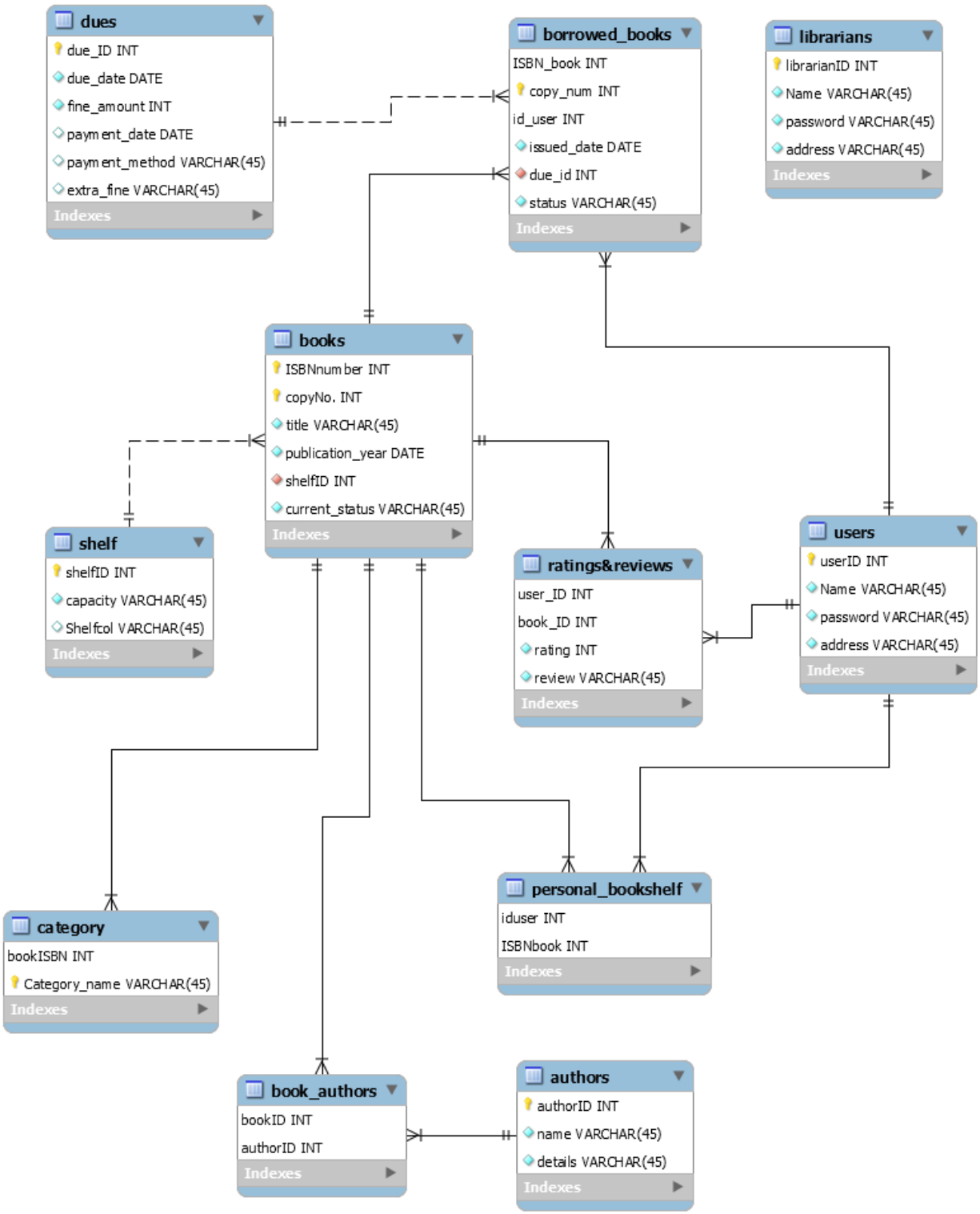
10.BorrowedBooks:
This table contains all the books that are issued from the library to users
Primary Key - (user_id, book_id **)**
Foreign Key - (user_id from user table, book_id from book table **)**

- ➢ user_id
- ➢ book_id
- ➢ copy number
- ➢ issue date
- ➢ status
- ➢ due_id

11.Dues table:
This table contains all the dues and their payment modes
Primary Key - (Due_id **)**

- ➢ Due_id
- ➢ Due_date
- ➢ Fine amount
- ➢ Extra fine
- ➢ Payment date
- ➢ payment_method

ER from Mysql workbench:



Relationships among the tables:

1.user table:

In the user table, we have all the required details of the users along with their login details. We have 2 kinds of users: students and faculty, in the last attribute we can fill that.

2.Users to books_borrowed:

In this, the list of users who borrowed the books from the library. It contains the book issued and the status of the book, including all the remaining information about book issue.

3.Books_borrowed to dues:

Books_borrowed table also has a foreign key dueID, referencing the **dues table.** Where the dues table contains the complete information about each due. Date of payment, mode of payment, extra fines if applicable etc.

4.Books to Authors:

As some books could have multiple authors, we cannot use authorID in the books table. The relation between them is **many to many.** So, we need to make one more table to make this relationship. We have the **Book_Author** table which contains the **bookID** and **authorID** as attributes. With both of them together as the primary key.

5.Books to category:

Here a book may fall under different categories and in a category, there can be a lot of books. So, this is a **many to many** relationship. That's why we made a new table **category** where we keep the list of books and their categories.

The primary key is bookID and category combined.

6.Book to shelf:

There are different shelves with unique ids. Each shelf has a different capacity. One book can be kept on only 1 shelf but a lot of books can be kept on 1 shelf. So, it is **many to one** relationship. Therefore, we keep shelfID as the foreign key in the **books** table referencing the **shelf** table.

7.Books-Users-Reviews and ratings:
In this library management system, the user has the chance to give a rating and review of the book issued by him. It contains bookID, userID of the user and the review along with rating.

8.User to Personal bookshelf:
This is the personal bookshelf that each user maintains on his own. It is just like a wishlist where the user can add his favourite books for later reverences and also maybe for later issuing.