Library Organization Database Application
Group Name: "The Lost Readers"
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Problem Statement:

Libraries are complicated. There are many things to keep track of including book location, book information, checkout status, etc. Not to mention the various other items found in libraries like movies, CDs, and laptop chargers to name a few. Our proposal is to create a library organization and management database application. This would allow librarians to keep track of everything that goes on in the library and help library members locate books/items by using additional location markers, such as the cardinal direction system. This command-line application would also provide library members with a profile that can be used to reserve books and create wishlists. A database is necessary for this application because of the large number of books and other items stored within a library.

Conceptual Database Design
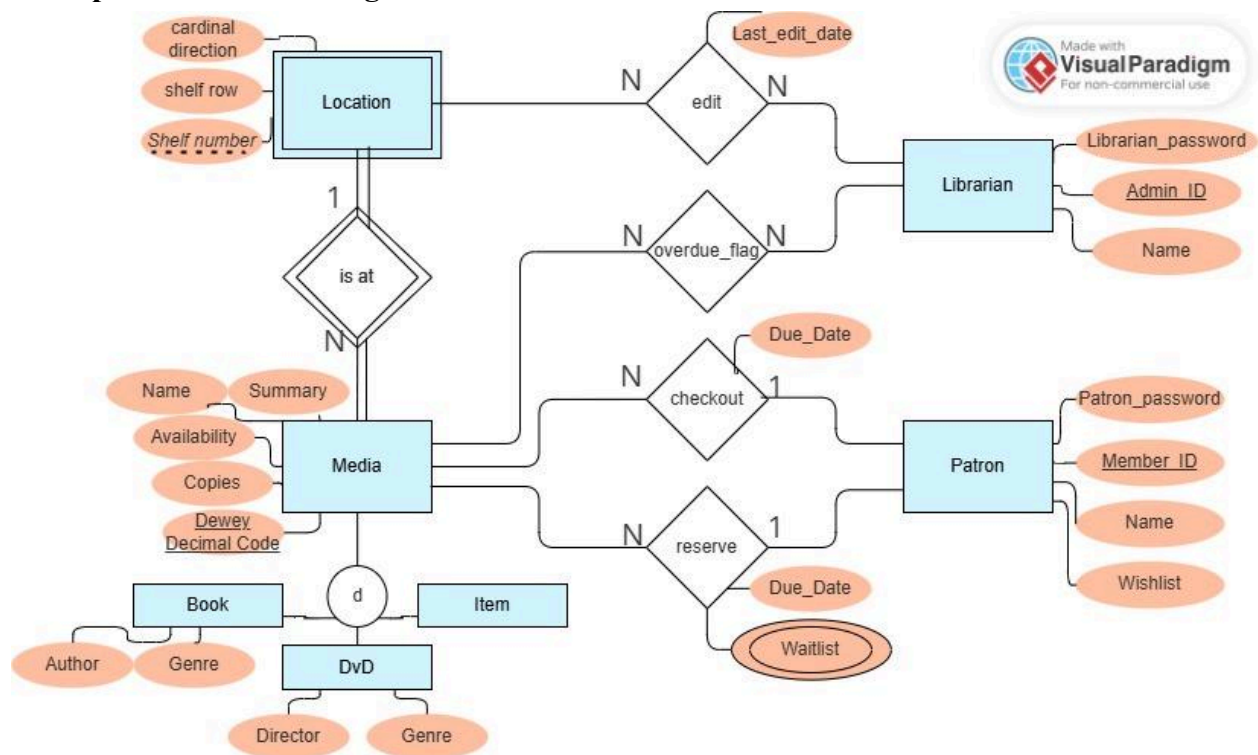

Assumptions/Description:

The 'Media' entity type is a superclass that includes three different subclass media types: 'Book', 'DvD', and 'Item'. Each media item has a unique Dewey decimal code, as well as attributes name, availability, summary, and copies. The 'Book' subclass contains two more attributes for author and genre. The 'DvD' subclass contains attributes for director and genre.

The 'Location' weak entity type is owned by the 'Media' entity time. It contains the physical location of each media type. It includes attributes shelf number, shelf row, and cardinal direction referencing the side of the shelf where the media is located.

The 'Librarian' entity type represents each librarian who works at the library. Each librarian has a unique admin id used for logging in. It also includes attributes name and librarian password. The librarian can edit the location of each media item. The last edit date is stored as a local attribute in the edit relationship. The librarian is notified for each overdue media item by the 'overdue_flag' relationship.

The 'Patron' entity type represents each patron who has a library account. Each patron has a unique member id used for logging in. It also includes attributes, patron password, name, and wishlist. Patrons can checkout media items with the checkout relationship which contains the local attribute due date. Patrons can also reserve media items with the reserve relationship which contains the local attribute waitlist. Waitlist contains a reference to each patron who has reserved that media item.

Logical Database Design
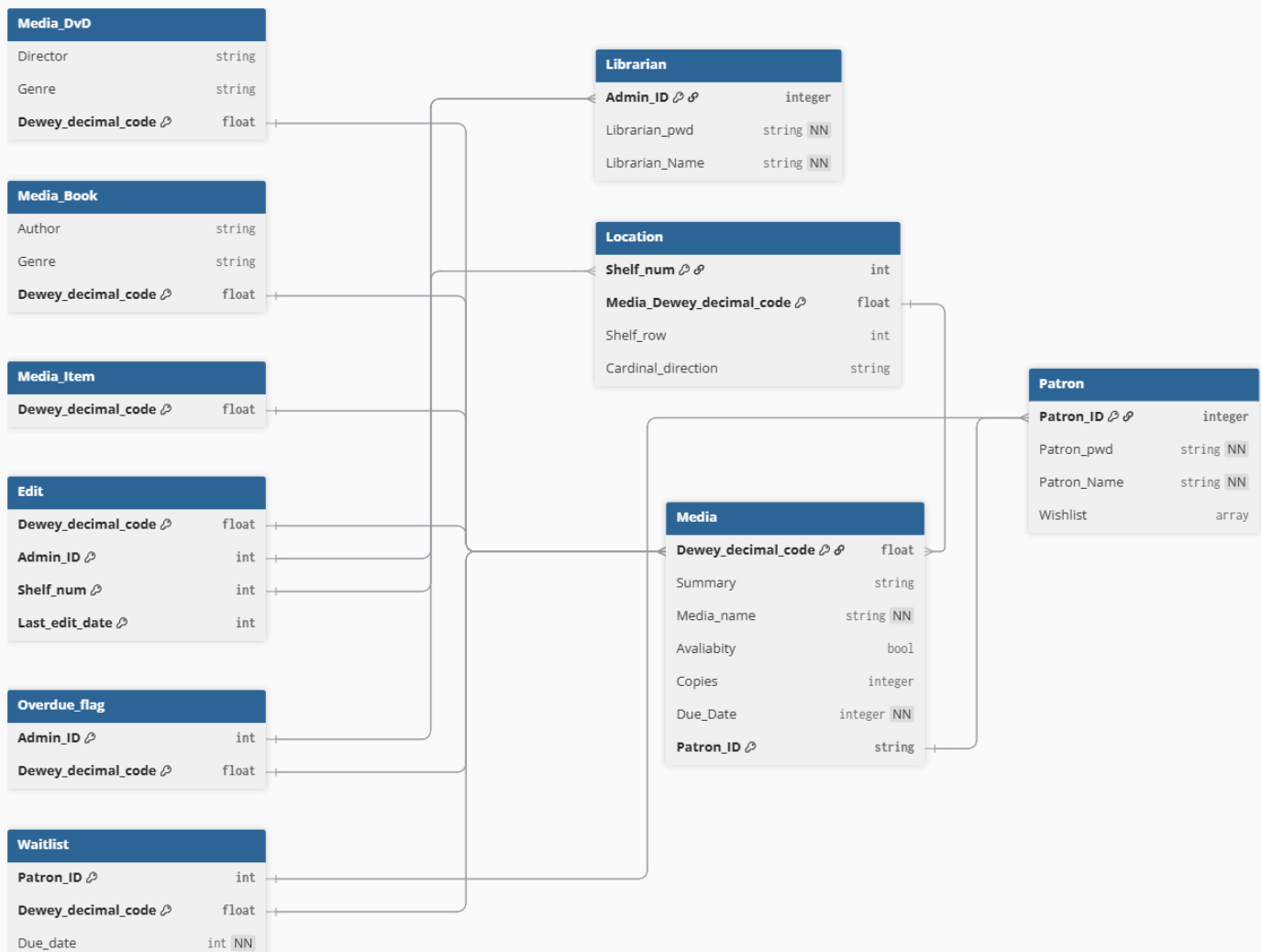
Summary Table of Data Types

Table	Attribute	Type	Constraint
Media	Dewey_decimal_code	Float	Primary Key
Media	Summary	string	
Media	Media_name	string	NOT NULL
Media	Availability	bool	
Media	Copies	integer	
Media	Due_date	integer	NOT NULL
Media	Patron_ID	string	Foreign Key
Media_Book	Author	string	
Media_Book	Genre	string	
Media_Book	Dewey_decimal_code	float	Foreign Key
Media_DvD	Director	string	
Media_DvD	Genre	string	
Media_DvD	Dewey_decimal_code	float	Foreign Key
Media_Item	Dewey_decimal_code	float	Foreign Key
Librarian	Admin_ID	integer	Primary Key
Librarian	Librarian_pwd	string	NOT NULL
Librarian	Librarian_name	string	NOT NULL
Patron	Patron_ID	integer	Primary Key
Patron	Patron_pwd	string	NOT NULL

Summary Table of Data Types Cont.

Table (cont)	Attribute	Type	Constraint
Patron	Patron_name	string	NOT NULL
Patron	Wishlist	array	
Location	Shelf_Num	integer	Primary Key
Location	Dewey_decimal_code	float	Foreign Key
Location	Shelf_row	integer	
Location	Cardinal_Direction	string	
Edit	Admin_ID	integer	Foreign Key
Edit	Dewey_decimal_code	float	Foreign Key
Edit	Shelf_Num	integer	Foreign Key
Edit	Last_Edit_Date	integer	
Overdue_flag	Admin_ID	integer	Foreign Key
Overdue_flag	Dewey_decimal_code	float	Foreign Key
Waitlist	Patron_ID	integer	Foreign Key
Waitlist	Dewey_decimal_code	float	Foreign Key
Waitlist	Due_Date	integer	NOT NULL

Application Program Design
　　　　This is a command-line application so there is no graphical user interface.

Installation Instructions
This application can be installed on Windows, Linux, and MacOS. This program can then be run on a terminal.
To install the library database application the following programs need to be installed:
1. Python 3.x
   a. Windows: https://www.python.org/downloads/
   b. MacOS: Needs Python 3.10 which is different from the preinstalled version
   c. Linux: Usually preinstalled or can be installed with a package manager
2. MySQL Connector for Python
   a. Can be installed via: pip install mysql-connector-python
3. MySQL Server
   a. Windows/MacOS: https://www.mysql.com/downloads/
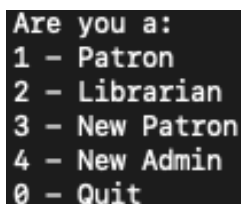   b. Can be installed via: sudo apt install mysql-server

Next, the repository needs to be installed from GitHub.
1. Clone the GitHub repository
   a. git clone from https://github.com/legoguy77777777/LostReadersDatabase.git
      cd LostReadersDatabase
2. Then you can run the program:
   a. python main.py
   b. MacOS: python3.10 main.py

User Manual
Welcome Menu:
- When the program starts you will be prompted to select Patron login, Librarian login, create a profile for patron or admin, or quit.

```
Are you a:
1 - Patron
2 - Librarian
3 - New Patron
4 - New Admin
0 - Quit
```

- 1 - Patron: Entering 1 will bring you to the Patron login page.
- 2 - Librarian: Entering 2 will bring you to the Librarian login page.
- 3 - New Patron: Entering 3 will bring you to the Patron create profile page.

- 4 - New Admin: Entering 4 will bring you to the Admin/Librarian create profile page.

1. Patron

Patron Login:
- Once brought to the login page you will be asked to enter whether you are a patron or a librarian. Enter 1 for Patron.
- You will then be prompted to enter your Member ID and password.

```
Please enter '1' for Patron Login or '2' for Librarian Login: 1
Please enter your ID (enter '0' to quit): 8675309
Please enter your password (enter 0 to quit): ilovecats
```

- Once you are successfully logged in, you will be brought to the Patron Menu.

Patron Menu:

```
What would you like to do?
Patron Menu:
1 - Search media
2 - Locate media
3 - Reserve media
4 - Checkout media
5 - View wishlist
6 - Delete item from wishlist
7 - Edit password
0 - Quit
Please enter the number of the menu option you would like to use:
```

- Once brought to the Patron Menu, you will be prompted to select from one of the options.
- 1 - Search media: Entering 1 will allow you to search for media based on Dewey Decimal Code, Title/Name, Genre (for books and dvds only), and Author/Director (for books and DVDs only). The program will guide you through the process of searching for media. If the item is available in the library, the program will give the location of that item. If the item is at the library but not available to be checked out, you will be asked if you would like to reserve that item.

```
What would you like to search by?
Search Menu:
1 - Dewey Decimal Code
2 - Title/Name
3 - Genre (Book and Dvd only)
4 - Author/Director (Book and Dvd only)
5 - Quit (or press any key)
Please enter the number of the search method you would like to use:
```

- 2 - Locate Media: Entering 2 will prompt you to enter the Dewey Decimal Code of the item you wish to locate. You will then be presented with the location of that item with the shelf number, shelf row, and cardinal direction the media is facing.

- 3 - Reserve Media: Entering 3 will allow you to reserve an item. The Dewey Decimal Code of the item is needed in order to reserve the media. If this is not known, the search media option can be used to find the Dewey Decimal Code. If the item you are attempting to reserve is available, you will be prompted to check it out. Otherwise the item will be reserved under your name and id.
- 4 - Checkout Media: Entering 4 will allow you to checkout media. You will be prompted to enter the Dewey Decimal Code of the item. You can find this information with the search media option if the code is not known. You will then be prompted to enter your Member ID and to provide confirmation of the item you wish to checkout.
- 5 - View Waitlist: Entering 5 will allow you to view items on your wishlist. You will then be prompted to enter your Member ID. Once you have done this, you will be shown your Waitlist.
- 6 - Delete time from waitlist: Entering 6 will prompt you to enter your Member ID. Then it will prompt you to enter the Dewey Decimal Code of the item you wish to remove from your waitlist. After that, the item will be removed from your waitlist.
- 7 - Edit Password: Entering 7 will allow you to change your password. First you will be asked if you are a Patron or Librarian, enter 1 for Patron. You will then be prompted to enter your ID, current password, and a new password.
- 0 - Quit: Entering 0 performs no additional actions

Once you finish an action, you will be prompted if you would like to continue or not. Entering y will allow you to continue will bring you back to the patron menu; however, entering n will bring you back to the initial menu.

2. Librarian
Librarian Login:
- Once brought to the login screen, you will be asked to specify patron or librarian, enter 2 for librarian. You will then be prompted to enter your Admin Id and password.

- You will then be brought to the Librarian Menu.

Librarian Menu:

```
What would you like to do?
Admin Menu:
1 - Return media
2 - Edit media location
3 - Add media into system
4 - Delete elements from system
5 - View overdue book
6 - View media inventory
7 - Edit password
0 - Quit
Please enter the number of the menu option you would like to use: []
```

- 1 - Return Media: Entering 1 will prompt you to enter the Dewey Decimal Code of the item you are logging the return of. Then you will be prompted to enter the MemberID of the patron who checked out the item.
- 2 - Edit Media Location: Entering 2 will prompt you to enter the Dewey Decimal Code of the item you are changing the location of. Then you will be prompted to enter the new shelf number, the new shelf row, and the cardinal direction that the media is now facing. You will then be prompted to hit the ENTER key to affirm your action.
- 3 - Add Media into System: Entering 3 will present you with all of the data stored in the library database. Then it will present you with a menu to choose which database table you wish to add to:
    - 1: This acts the exact same as signing up as a new librarian (See Below)
    - 2: This acts the exact same as signing up as a new patron (See Below)
    - 3: You will be prompted to enter your librarian (admin) ID. Then you will be prompted to enter the name, dewey decimal code, summary, and number of copies of the media you wish to add to the system in that order.
    - 4: This starts the exact same as choosing option 3 (see above). Then you will be prompted to enter the author and genre of the book you are adding to the system, in that order.
    - 5: This starts the exact same as choosing option 3 (see above). Then you will be prompted to enter the director and genre of the DVD you are adding to the system, in that order.
    - 6: This is the exact same as choosing option 3 (see above). However, this will also enter this media as an item.
    - 7: You will be prompted to enter your librarian (admin) ID. Then you will be prompted to enter the dewey decimal code, shelf number, shelf row, and cardinal direction of the item you are putting on the shelves of the library for the first time.
    - 8: You will be prompted to enter the member ID of the patron who requested you add a piece of media to their waitlist. Then you will be prompted to enter the dewey decimal code of the media and the due date when that media will become available.

- 4 - Delete Elements from System: Entering 4 will ask you if you want to delete information about media, a patron, or a librarian, by entering 1, 2, or 3 respectively. Additionally, you will be given the option of entering 0 to quit and not delete any information
  - 1: Entering 1 from here will prompt you to enter the dewey decimal code of the media whose information you wish to delete
  - 2: Entering 2 from here will prompt you to enter the member ID of the patron whose information you wish to delete.
  - 3: Entering 3 from here will prompt you to enter the librarian (admin) ID of the librarian whose information you wish to delete.

  After any of those three are completed, you will be prompted to if you are sure. Entering y will then delete the information.
- 5 - View Overdue Media: Entering 5 will show you the list of all overdue media.
- 6 - View Media Inventory: Entering 6 will present you with the amount of media not checked out. Then you will be presented with the amount of total media in the library. You will then be prompted if you would like to see the amount of books, DVDs, or other items by entering 1, 2, or 3 respectively. If you enter 1, you will see the sum total of books in the library. If you enter 2, you will see the sum total of books in the library. If you enter 3, you will see the sum total of books in the library.
- 7 - Edit Password: Entering 7 will allow you to change your password. First you will be asked if you are a Patron or Librarian, enter 2 for Librarian. You will then be prompted to enter your ID, current password, and a new password.
- 0 - Quit: Entering 0 performs no additional actions

Once you finish an action, you will be prompted if you would like to continue or not. Entering y will bring you back to the Admin Menu; however, entering n will bring you back to the initial menu.

3. New Patron
Patron Sign Up
- Upon selecting this page, you will be prompted to provide your name, followed by your password. As long as the password is not 0, you will then be given a Member ID. If you are given this MemberID, you will then be prompted to enter it. If your password is 0, then you will not be prompted with a member ID and will not be logged into the system.

Once you finish you will be brought back to the initial menu.

4. New Librarian
Admin Sign Up
- Upon selecting this page, you will be prompted to provide your name, followed by your password. As long as the password is not 0, you will then be given an AdminID. If you are given this AdminID, you will then be prompted to enter it. If your password is 0, then you will not be prompted with an AdminID and will not be logged into the system.

Once you finish you will be brought back to the initial menu.