Final Project: Library Management System

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Introduction

In this project, we plan to implement a library management system with basic book-borrowing functionalities and some financial services.

There will be two user types, and the first type will be regular users. The regular user should be able to search, borrow, return, and renew books. They will also be able to view the number of copies available at the current location and send book requests to other sites if necessary. The users can also pay for the fees through this management system if there is a late return punishment fee or book damage fee associated with the book borrowing records.

The second user type is library employee/volunteer. They will have permission to access all the regular users' functionalities and check their payment/volunteer hours and the library's monthly funding.

There will also be an account summary that records the monthly money in (funding to the library, late fee, and damage fee), money out (employee payments), and current balance for each location.

Supported functionality

<u>Library Employee / Volunteer</u>

- Able to check employee payment
- Able to check the library's monthly funding
- Everything that library users can do

<u>Library Users</u>

- Able to find books based on: keywords, author, title, ISBN, category, etc.
- Able to view the number of copies left in the library system
- Able to borrow, return, and renew books
- Able to request books from the specific library location
- Able to pay for late return punishment fee and book damage fee
- Able to search for the most popular books

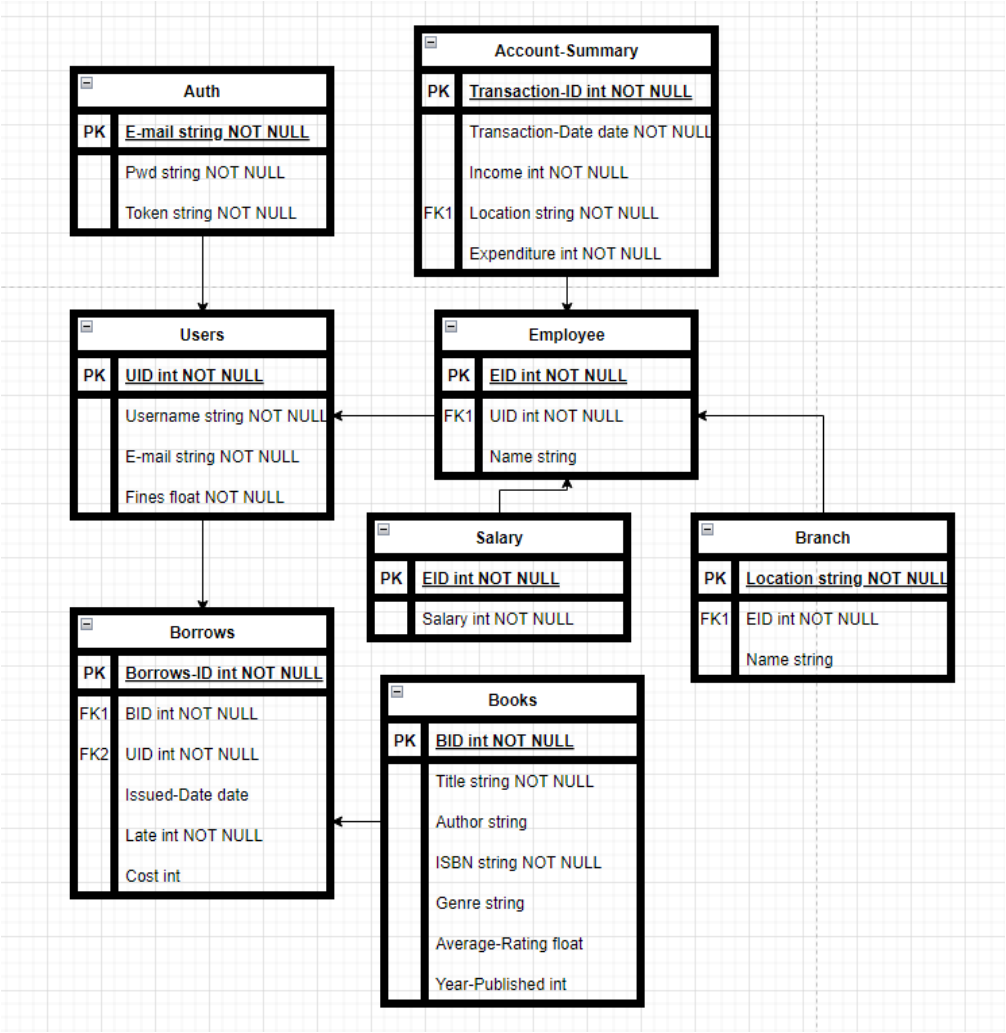
Database Design Description

The database will store user login data, book data, library account data, location data, employee data, and library account data.

The database will store the login email, password, and token when the user register. When the user borrows a book, the book's book id, user id, and book data will be stored in the borrows table. The due date and cost of the book will also be stored in order to calculate the late return punishment fee if necessary. The book data includes title, author, ISBN, category, year published, and average rating. The book data will also be used for users to search the book. When users request books, the data will also be stored in the borrows table.

Another part of the database is the library account. The account summary table includes all the transaction data. The transaction includes employee salary, location of the transaction, and expenditure at the library branch. When the employee logs in using their user ID, they will be able to see their salary and the library branch they are working at.

ER Diagram & Schema



Database Population

We will randomly generate 1000-10000 regular users and around 100 employee users, along with their usernames/passwords, to simulate a working system in reality.

We are planning to have 3-4 pseudo-locations and use them to test the book request function in the system.

For the books available in the library, we have found a book dataset, 7k Books, which includes ISBN, title, authors, categories, published year, and average rating. We can randomly assign parts of the book dataset to the 3-4 library locations.