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Project: SQL Programming Project

Design and Architecture

Several options for framework and tools, such as Android and NodeJS, came into my mind but finally I chose phpMyAdmin to be the database tool to connect local MySQL, and PHP and HTML are used as frontend and web application technology.

I have experience on Android development and SQLite would be the database option for Android development. However, I think SQLite is not popular and it is lack of many necessary constraints and functions, so I decided to not choose it. The reason I decided web application to be the front-end technology because I want to have experience and practice on MySQL. In addition, PHP is very popular in recent years, I would like to learn a lot about PHP from this project. There is a very strong connection between MySQL and PHP, PHP has strong supports with MySQL. And there is tons of resource about it on websites. Moreover, phpMyAdmin is a PHP-based, MySQL database management tool that is architected on a web site in a Web-Based manner, allowing administrators to manage MySQL databases using a Web interface.

I have used most of the design of the schema the professor provides, but I made a little modification. The first modification I made is to add an attribute, Num\_Books, into table, Borrowers, which is to record the number of books a borrower have borrowed from library. The max number is three as the material mentioned. The second one is to add an attribute, Availabilty, into Book table, which is for record if a book has already been borrowed. The data type is integer and domain are 0 and 1, which 0 represent the book has already been borrowed, 1 represent the book is available for users. The design of key constraints from material are totally used as part of schema.

I have create about 10 website pages for this project. Main.html is the main entrance of this project. After enter into the page, a search bar is on the top of the page, and user can input the book they want to borrow, and they are able to get all match books by inputing book title, authors and ISBN. After this operation, a lists of books with its information come out on page. User can select any of the book they are interested, and then they will be brought to other page to prompt user to input their card ID. If the book is already borrowed by others, the action is failed and if the user has already borrowed 3 books in past, the action will be failed, either. If a user does not have an account, the user can register one and access the registration page by clicking on the button on Main.html. After user input all necessary information, an account is created in Borrower table, and number of books is 0 by default. Moreover, user can check in books by clicking on the button on Main.html. Then input the information about the book they borrowed into search bar, a list of relevant book will come out on the page then choose the book the user borrowed. If a book is not returned on time, fines are created under users account. To pay fines, users can access payment page by clicking button on main page. All overdue books will be listed on the page, and libraries are able to pay the fines by clicking button, PAY NOW.

The above are basically the ideas of designs and patterns for this project.