Project Deliverable 3
CSCI 327
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Goal: The goal of our third project deliverable is to fully implement a functional application system for our library database using the specifications and database schema that have been previously established. This deliverable took our project from simple planning to an actual website as we worked to create the database schema, application programs, and flood the tables with sample data that could demonstrate how our website is to work.

Description of the creation of the database schema and instances: The library database was created to include tables for documents, users, document copies, branches, borrowings, and reserves. The documents of the database are split into books, DVDs, and journals and they all have their own tables that contain additional information about them such as the director or author's name. The authors, editors, and directors of these documents are linked to them through their own table category while copies of documents are tracked by a branch. The users are split up according to if they are library members or librarians and their main menus look different according to the actions they can do. Librarian assignments are stored in their own tables, as are any borrowings and reserves. The code is all connected through the use of foreign keys so the data can stay consistent. All of the tables hold sample data so all functions of the database system are able to be tested.

Description of the application programs: Users are able to enter their login information into the main menu and certain programs will become available to them depending on if that user is a member of the library or a librarian. The member menu allows them to search for documents by their titles, document ids, or publishers, check out and return documents, calculate fines, see all of the documents from a specific publisher, and log out of their accounts. The librarian menu allows them to add a new copy of a document, add new readers, check on the status of documents, see information about branches, look at the ten most frequent borrowers, look at the ten most borrowed books, look at the average fine per reader, and log out of their accounts. The menus interact with the library database using sql commands and there is enough sample data in the database to allow for every function to be tested.

Revisions made to the specifications described in the Phase 2 Deliverable: We included the new attribute reservation_date to the reserves table because we thought it would be helpful to keep track of when documents were put on reserve. We also included the new attribute doc_type to the document tables to further clarify and distinguish the documents from each other, something that is particularly helpful if there are multiple types of documents with the same title. We included the new attribute copy_num to the borrows table to clarify exactly which copy of a document has been lent out if the library has multiple copies. We chose to not include the isbn attribute in the book_authors table because we thought it was unnecessary if we were already including the doc_id of the book. We then did the same thing for dvd_id in dvd_directors and journal_id in journal_editors because we thought those were also unnecessary with the presence of doc_id in the tables.

Problems encountered in Phase 3 and the solutions: Populating the tables took us a lot of time because we had to carefully insert the data in correct order to satisfy all the foreign-key constraints and other dependency rules. Also it was very easy to get disorganized with the amount of document ids and documents we were trying to input so we created a separate word doc that contained charts that mirrored the tables in our databases to help keep everything clean and organised.