2023

Database Report

COMP-1021 FUNDAMENTALS OF DATABASE AND WEB TECHNOLOGIES

JAKE CUNNINGHAM

Word Count: 955 Words

Contents

Functionality

The database can add new data via front end forms as well as being able to view the data that has been added, the data is sorted into columns in the table. These tables are connected via relationships that direct the foreign keys where to end up. This can be data such as the barcode of a book or the ID number of a borrower. The foreign keys were then used to log which borrower has borrowed which book and on what date. The other forms will allow the librarians to add new users to the system or add new books to the system, numbers are stored randomly so each number is unique and non-sequential.

To navigate the forms, Navigation buttons allow for navigating around the database, the home button opens the home page while also closing the currently open page. This prevents any data locking or issues with multiple forms being open at once. The exit button allows the user to close the form prompting them to save anything that hasn't already been saved.

When a user adds a new record on, the system has different menus so that a new borrower can be added to the library system, a new book can be added to the system or when a borrower wants to borrow a book, the user can pull data from both tables and create a new loan with data showing who is borrowing what as well as a time and date stamp of when they borrowed it.

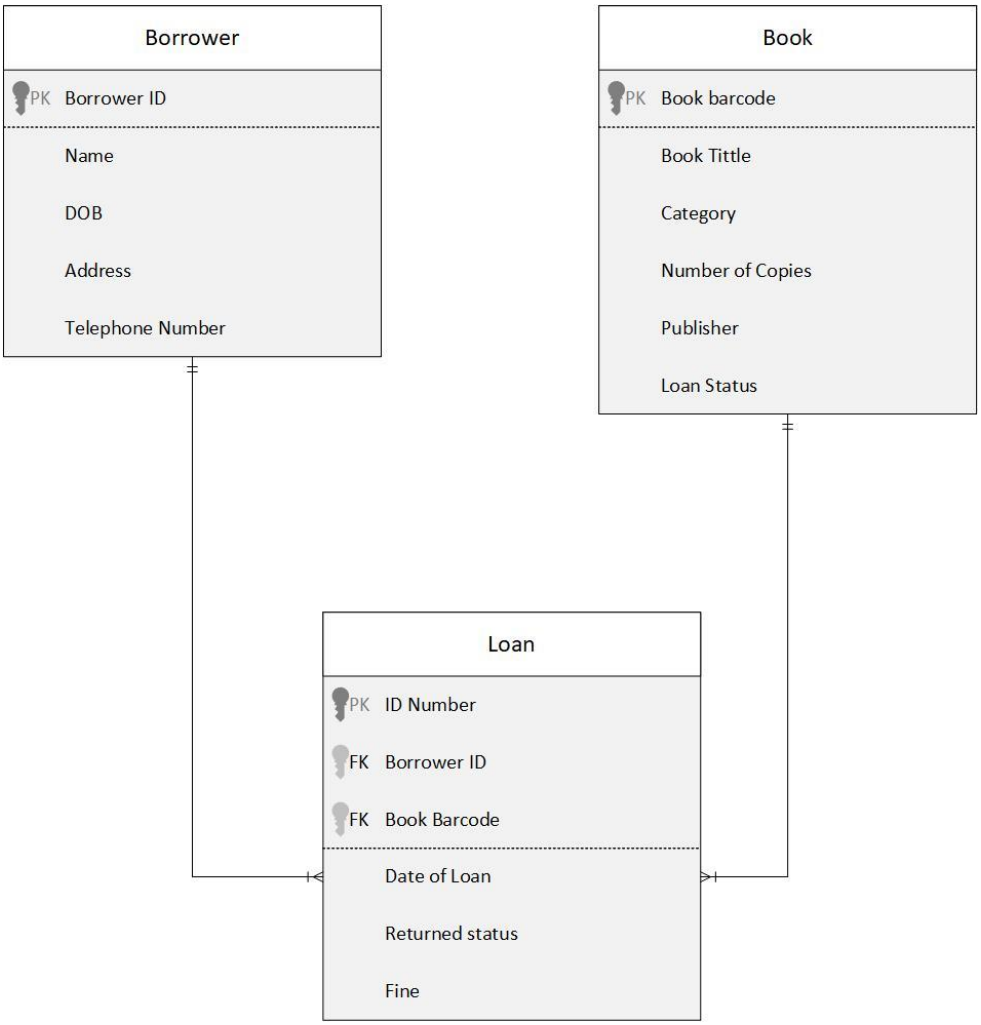
Database Design

The database separate tables showing the different forms of data, one for the Borrower, one for the book and a final one where the loans are stored after a borrower has borrowed a book. The data is stored in ladled columns and has appropriate data types applied so that incorrect data cannot be stored.

In designing the database, the home screen should allow for easy navigation around the front end. Each form has a home button as well as a close button, these allow the user to quickly navigate back to the home page or close the form if they wish. These buttons are in the same place on each form so that the user will instantly know where the common functions are on each page.

There is a header and a body section on the forms, this is so that the common functions can be separate from the changing ones, each header is identical on each page. It contains the Time and date in the top corner, the name of the library in the middle as well as the home and close buttons on the right side. The body which is also in a lighter colour to the header, contains the fields that allow the users to input any information that is going to be added to the tables. The arrows allow for navigating through the fields added to the database.

Entity Relationship Diagram



The ERD shows how the database will have 3 tables, each containing the different sets of data. It also shows how there is a one-to-many relationship between the borrower table and the Loan table. This is because there can be only one borrower at a time but there can be many loans. Also, the ERD shows the one-to-many relationship between the Book table and the Loan table, similarly this is because one book and be loaned many times.

When a loan is places, the Loan entity will hold the foreign keys from the borrower, called the Borrower_ID and the Book, called the Book_Barcode. These foreign keys will be sued to identify both the borrower and the book by using these keys.

Building the Database

The database first began out as an ERD diagram, This was designed so that It would be planned out before building the database as well as a map on how the data base will be build and communicate between the forms.

The ERD was used to create the tables that will hold the data. 3 were created, these are for the 3 different types of data that will be held. There is tblBook, for holding the details of the books that are kept at the library. tblBorrower, this holds the data for the various users of the library, such as their name, date of birth and address. Finally, there is tblLoan, this hold the details of the current loaned books and who holds them as well as if they have been returned yet.

Relationship data was created to define where the primary and foreign keys are, as per the ERD the borrower_ID, from tblBorrower and Book_Barcode, from tblBook, needed to have a one-to-many relationship with tblLoan.

The forms were then built for the database, first created was a default form so that each form after would look the same (Hogan, 2018). The design was then used to create a form for each of the tables as well as creating a home page so that navigation would be much easier and the user would be able to browse to the other forms from there.

Problems and Bugs

A bug that was encountered, was that when creating a new loan, a borrower and book were not able to be selected, only one set of data in one box could be entered. Selecting data in the other would clear the data chosen in the previous box. Some investigation was done into what could be causing this and this resulted in the data was being pulled from the correct table. However, when the data was being added to tblLoan, both boxes were trying to save their foreign keys in the same field. This was able to be rectified and the data was then being added correctly.

References

Hogan, R., 2018. *A practical guide to database design.* s.l.:CRC Press.