

Library Management System

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Problem

The objective of the Library Management System is to create an environment for libraries to manage their book inventory by storing, managing, and editing their data. This project is designed with a graphical user interface (GUI) and consists of four pages: home, adding and deleting books page, checkouts and returns data, and a search bar page. The GUI is designed on the RAD Studio application. The clean and responsive design will ensure that the system is accessible and user-friendly.

Implementation

The GUI is built using RAD Designer, where it allows users to drag and drop elements from the Palette Tool Window. In the LMS, we used the ControlTab to create a control page with multiple pages attached to present different features. Every element has its properties and events to make it easier to access and manipulate. To assign a desired action to an element, we used the events menu.

Functions:

After designing the GUI, creating relatable variable names, and summoning the element, we designed the actions (functions) as follows:

Add New Books

Functionality: It allows users to add new books to the inventory.

Implementation:

- Users input the book name in the specified text field and then click the Add button or press the Enter key.
- The system checks for duplicate book names. If the book name is unique, it is added to the inventory along with a unique ID. If the book name is not unique, the system shows an error message.

Delete Books

Functionality: It allows users to delete books from the inventory using the book ID.

Implementation:

- Users input the book ID in the specified text field and then click the Delete button or press the Enter key.
- The system searches for the book ID in the inventory. If found, the book is removed from the inventory. If the book ID is not unique, the system shows an error message.

Update Book Status

Functionality: It allows users to update the status of a book (e.g., checked out, returned).

Implementation:

- Users input the book ID in the specified text field and select the new book status from the specified combo box.
- The system verifies the current status and updates it in the transactions and in the inventory if applicable.

Search Books

Functionality: It allows users to search for books by name.

Implementation:

- Users input the book name or partial name in the specified text field and then click the Search button or press the Enter key.
- The system searches in the inventory for matching book names and displays the results

Testing and Results

Before testing, we supplemental some features to enhance the effectiveness of the user experience by considering some test cases. Some examples include not being able to add a book to the returns list without it being checked out and vice versa.

In conclusion, the application met all design requirements presented in creating a GUI for book inventory, searches, checkouts, and returns. We succeeded in providing an organized and easy-to-use GUI with multiple features to create a complete management system ready to be published.