Library Management System

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Introduction

- This presentation describes the implementation of a Library Management System using Java and Object-Oriented Programming (OOP) principles.

Methods and Their Functions

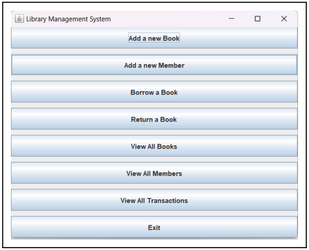
main(String[] args)

- **Function:** The entry point of the application. It invokes the `createAndShowGUI` method to initialize the GUI.

Methods and Their Functions

createAndShowGUI()

- **Function:** Initializes and sets up the main `JFrame` and `JPanel` with buttons for different actions in the library management system.
- **Controls Used:**
  - `JFrame`: The main window of the application.
  - `JPanel`: A container to hold the buttons.
  - `JButton`: Buttons for various actions like adding a book, adding a member, borrowing a book, returning a book, viewing all books, viewing all members, viewing all transactions, and exiting the application.



Methods and Their Functions

addBookDialog()

- **Function:** Displays a dialog to input details of a new book and adds the book to the library's collection.
- **Controls Used:**
  - `JTextField`: Input fields for book ID, title, author, quantity, and genre.
  - `JOptionPane.showConfirmDialog()`: Displays the input fields in a dialog box.
  - `JOptionPane.showMessageDialog()`: Shows a confirmation message after adding the book.

Methods and Their Functions

addMemberDialog()

- **Function:** Displays a dialog to input details of a new member and adds the member to the library's member list.
- **Controls Used:**
  - `JTextField`: Input fields for member ID, name, and membership type.
  - `JOptionPane.showConfirmDialog()`: Displays the input fields in a dialog box.
  - `JOptionPane.showMessageDialog()`: Shows a confirmation message after adding the member.

Methods and Their Functions

borrowBookDialog()

- **Function:** Displays a dialog to input member ID and book ID for borrowing a book and processes the borrowing transaction.
- **Controls Used:**
  - `JTextField`: Input fields for member ID and book ID.
  - `JOptionPane.showConfirmDialog()`: Displays the input fields in a dialog box.
  - `JOptionPane.showMessageDialog()`: Shows a confirmation message after borrowing the book or an error message if the transaction fails.

Methods and Their Functions

returnBookDialog()

- **Function:** Displays a dialog to input member ID and book ID for returning a book and processes the return transaction.
- **Controls Used:**
  - `JTextField`: Input fields for member ID and book ID.
  - `JOptionPane.showConfirmDialog()`: Displays the input fields in a dialog box.
  - `JOptionPane.showMessageDialog()`: Shows a confirmation message after returning the book or an error message if the transaction fails.

Methods and Their Functions

viewAllBooksDialog()

- **Function:** Displays a table with all the books in the library.
- **Controls Used:**
  - `JTable`: Displays the list of books in a tabular format.
  - `DefaultTableModel`: Manages the table data.
  - `JScrollPane`: Enables scrolling for the table.
  - `JOptionPane.showMessageDialog()`: Displays the table in a dialog box.

Methods and Their Functions

viewAllMembersDialog()

- **Function:** Displays a table with all the members of the library.
- **Controls Used:**
  - `JTable`: Displays the list of members in a tabular format.
  - `DefaultTableModel`: Manages the table data.
  - `JScrollPane`: Enables scrolling for the table.
  - `JOptionPane.showMessageDialog()`: Displays the table in a dialog box.

Methods and Their Functions

viewAllTransactionsDialog()

- **Function:** Displays a table with all the transactions (borrowed and returned books).
- **Controls Used:**
  - `JTable`: Displays the list of transactions in a tabular format.
  - `DefaultTableModel`: Manages the table data.
  - `JScrollPane`: Enables scrolling for the table.
  - `JOptionPane.showMessageDialog()`: Displays the table in a dialog box.

Methods and Their Functions

searchBookById(int bookId)

- **Function:** Searches for a book by its ID and returns its index in the books array.
- **Parameters:** `bookId` - The ID of the book to search for.
- **Returns:** The index of the book if found, otherwise -1.

Methods and Their Functions

searchMemberById(int memberId)

- **Function:** Searches for a member by their ID and returns their index in the members array.
- **Parameters:** `memberId` - The ID of the member to search for.
- **Returns:** The index of the member if found, otherwise -1.

Thank You!

Thank you for your attention!