

Comprehensive Project Description: LibraryManager

1. Project Summary

The "LibraryManager" is a C# desktop application aimed at simplifying library operations, including book, member, and loan management. Designed with an intuitive interface, it ensures efficient handling of library activities for administrators.

Key Features:

- User authentication with login and registration.
- CRUD operations for books and members.
- Loan management (issue and return).
- Report generation for library monitoring.

2. Tech Stack

Language: C#

IDE: Microsoft Visual Studio

Database: Microsoft Access

Framework: .NET Framework 4.8

UI: Windows Forms

3. File Organization

Main Files:

- Solution: LibraryManager.sln
- Configuration: LibraryManager.csproj

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Key Code Files:

1. Program.cs:

Entry point of the application that initializes the program and starts with the login form.

```
Application.Run(new LoginForm());
```

2. LoginForm.cs:

Handles user login with username and password validation. If authentication is successful, the main form is displayed.

```
if (DatabaseManager.ValidateUser(username, password))  
{  
    MainForm mainForm = new MainForm();  
    mainForm.Show();  
    this.Hide();  
}
```

3. MainForm.cs:

Serves as the main dashboard, providing access to different features like book, member, and loan management.

4. ManageBooksForm.cs:

Handles CRUD operations for books:

Add a new book:

```
DatabaseManager.AddBook(new Book(title, author, year));
```

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Edit book details:

```
DatabaseManager.UpdateBook(selectedBookId, updatedBook);
```

Delete a book:

```
DatabaseManager.DeleteBook(bookId);
```

5. ManageMembersForm.cs:

Similar to ManageBooksForm.cs, this form manages CRUD operations for library members.

6. RegisterLoanForm.cs:

Handles loan management, including registering loans and marking books as returned:

```
DatabaseManager.RegisterLoan(memberId, bookId, dueDate);  
  
DatabaseManager.ReturnBook(loanId);
```

7. DatabaseManager.cs:

Acts as the interface between the application and the database. For example:

Connecting to the database:

```
using (OleDbConnection connection = new OleDbConnection(connectionString)) {  
  
    connection.Open();  
  
    // Execute queries  
  
}
```

4. Running the Project

Prerequisites:

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- Visual Studio 2019 or later.
- .NET Framework 4.8 installed.

Steps:

1. Open the solution file (LibraryManager.sln) in Visual Studio.
2. Build the project using Ctrl + Shift + B.
3. Run the program using F5 or execute the LibraryManager.exe file from the bin/Debug directory.

Database Configuration:

Ensure the LibraryManager.accdb file is present in the bin/Debug directory for proper functionality.