

Library Management System

Introduction:

The purpose of this application is to develop a web application that can manage the library system and also employees working in the library. The users can create, update, delete and get library items as well as employees information.

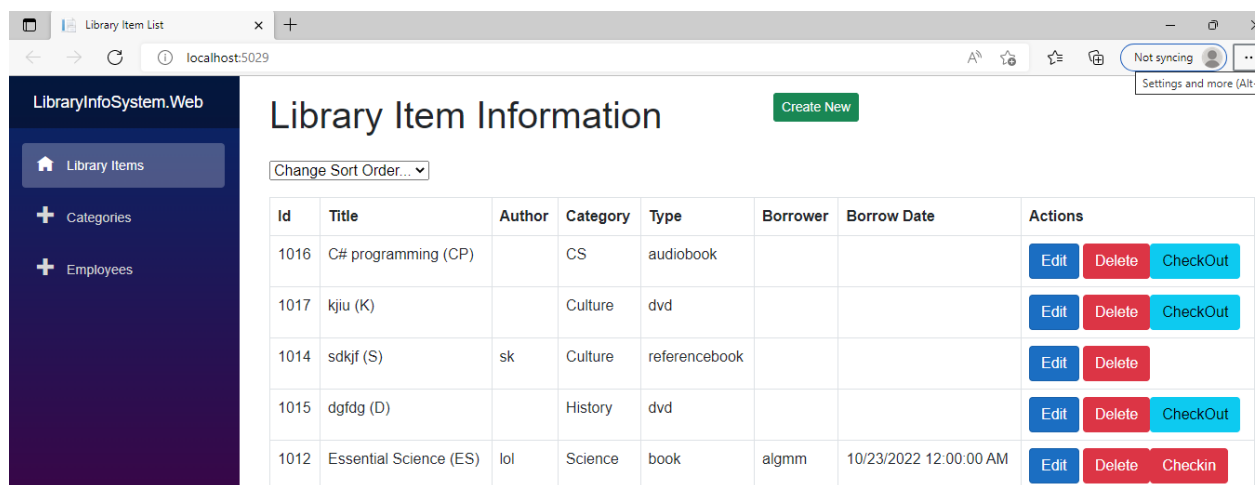
Description:

ASP.Net Web API is used to develop the API for this application. It provided the interface that clients can use to connect to this using the HTTP protocol. The client-side application is developed in Blazor Server that uses the HTTP client to connect to it and then gets the data from the server using this API interface. Entity Framework Core is used for accessing and storing data in the database. SQL Server is used for database management. Dependency injections and async programming is used for the development of this application.

Users' Guide:

List of Library Item:

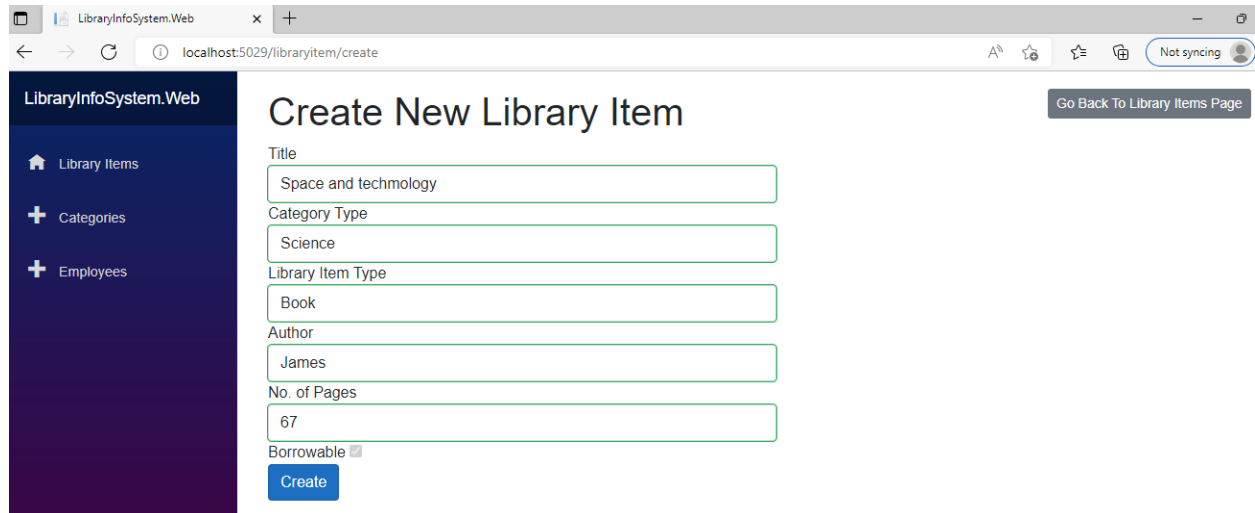
When the application starts, it displays the list of all the library items that are stored in the database. One the left-hand side of the page is the menu bar, using this menu user can open the different options. The list is sorted by category. The user can also sort by type of the library item. The tile of each library item is decorated with acronym. The user can create, edit, delete, check in and check out the library item. There are 4 different types of library items, book, reference book, DVD and audio book. These items can be checked out by the user except the reference book. If an item is checked out, it will display the borrower's name and date of borrow. When an item is checkout, it can not be checked in. The user can only check out this item. Similarly, if an item is in the library, the user can check out this item.



Id	Title	Author	Category	Type	Borrower	Borrow Date	Actions
1016	C# programming (CP)		CS	audiobook			Edit Delete CheckOut
1017	kjiu (K)		Culture	dvd			Edit Delete CheckOut
1014	sdkjf (S)	sk	Culture	referencebook			Edit Delete
1015	dghfdg (D)		History	dvd			Edit Delete CheckOut
1012	Essential Science (ES)	lol	Science	book	alghmm	10/23/2022 12:00:00 AM	Edit Delete Checkin

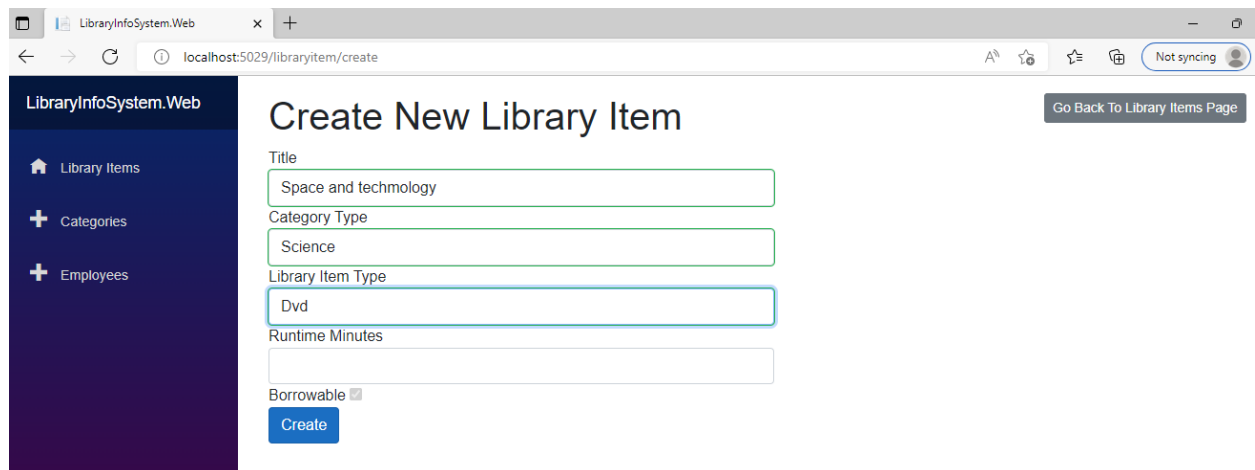
List Item Create page:

When user will click on the create button, the create page will open when user can add a new library item. Depending on the library item type, the user has to fill in the different information. If the type of library item is book and reference book, the user will fill in the title, category type, author and number of pages.



The screenshot shows a web browser window with the address bar displaying 'localhost:5029/libraryitem/create'. The page title is 'Create New Library Item'. On the left, there is a dark blue sidebar with the text 'LibraryInfoSystem.Web' and three menu items: 'Library Items' (with a home icon), 'Categories' (with a plus icon), and 'Employees' (with a plus icon). The main content area has a light gray background. At the top right of the main area is a button labeled 'Go Back To Library Items Page'. Below the title, there are several input fields: 'Title' (containing 'Space and technology'), 'Category Type' (containing 'Science'), 'Library Item Type' (containing 'Book'), 'Author' (containing 'James'), and 'No. of Pages' (containing '67'). There is a 'Borrowable' checkbox which is checked. At the bottom of the form is a blue 'Create' button.

If the type of library item is dvd or audio, the user will fill in the title, category type and run type minutes. This page also contains a button to move to the main page.



The screenshot shows the same web browser window and sidebar as the previous one. The main content area has the same title 'Create New Library Item' and 'Go Back To Library Items Page' button. The input fields are: 'Title' (containing 'Space and technology'), 'Category Type' (containing 'Science'), 'Library Item Type' (containing 'Dvd'), and 'Runtime Minutes' (which is empty). The 'Borrowable' checkbox is checked. At the bottom of the form is a blue 'Create' button.

If compulsory fields are left blank the application will give errors.

LibraryInfoSystem.Web x +

localhost:5029/libraryitem/create

LibraryInfoSystem.Web

Library Items

Categories

Employees

Create New Library Item

Go Back To Library Items Page

- The Title field is required.

Title

The Title field is required.

Category Type

Science

Library Item Type

Dvd

Runtime Minutes

Borrowable ☒

Create

Activate Windows
Go to Settings to activate Windows.

Type here to search

10:11 PM
10/26/2022

Edit Page:

The edit page is used to edit a library item. It will display the record of the library item to be edited.

LibraryInfoSystem.Web x +

localhost:5029/libraryitem/edit/1016

LibraryInfoSystem.Web

Library Items

Categories

Employees

C# programming

Go Back To List of Library Items

Id

1016

Title

C# programming

Category Type

CS

Library Item Type

Audio Book

Runtime Minutes

78

Update

Activate Windows
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Type here to search

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10/26/2022

Categories Page:

The categories page information about different type of categories. Each library item will belong to a category. The page has button to create a new category, edit and delete a category. The user can not delete a category if it is being referenced by the library item.

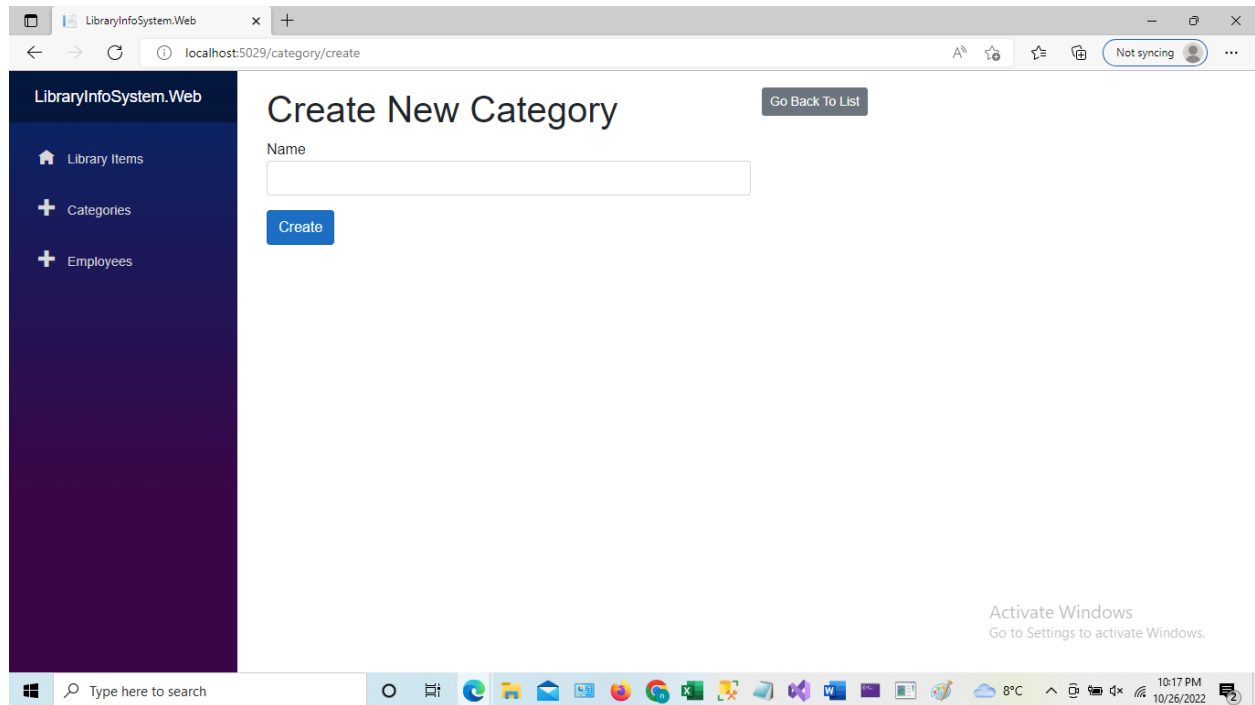
The screenshot displays a web application interface for managing categories. On the left, a dark sidebar contains the site name 'LibraryInfoSystem.Web' and navigation links for 'Library Items', 'Categories' (highlighted with a plus icon), and 'Employees'. The main content area is titled 'Categories' and features a green 'Create New' button. Below the title is a table with the following data:

Id	Title	Actions
1015	Culture	Edit Delete
1016	Science	Edit Delete
1021	History	Edit Delete
1022	CS	Edit Delete

At the bottom of the browser window, an 'Activate Windows' watermark is visible, along with the Windows taskbar showing the search bar, task icons, and system tray information (8°C, 10:16 PM, 10/26/2022).

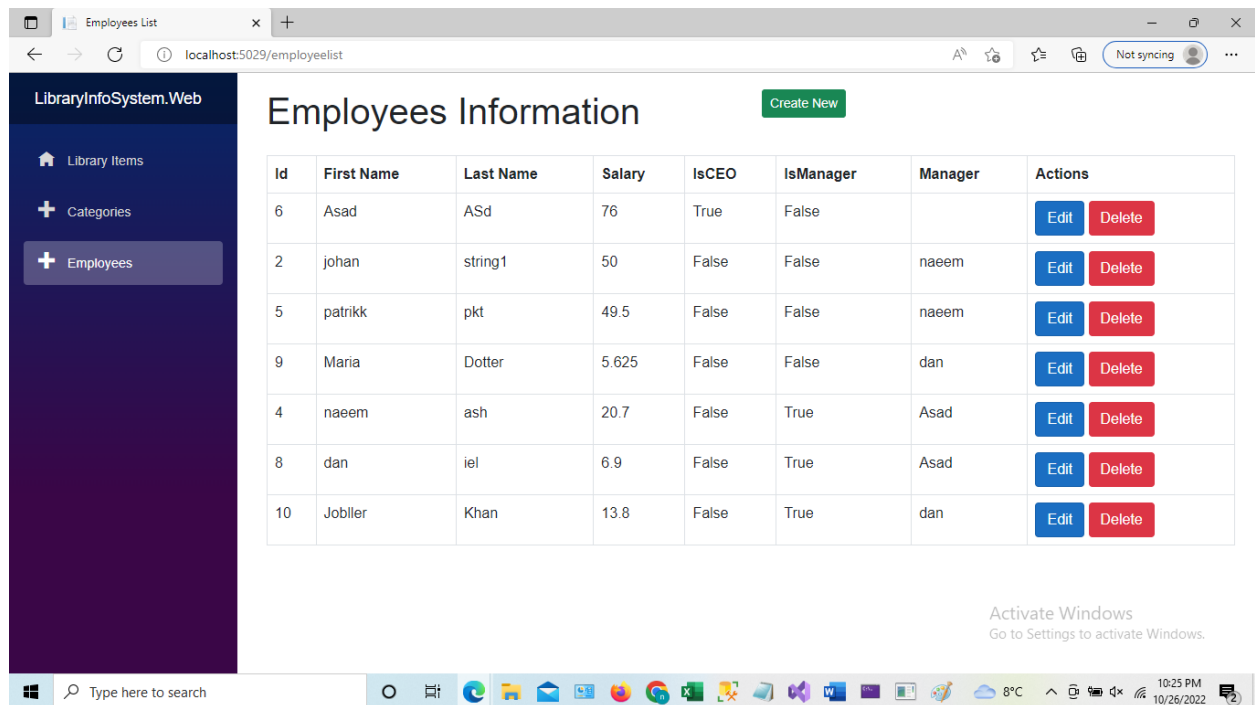
Create New Category:

This page is used to create a new category. The only field to enter is the name of the category. Name of each category must be unique otherwise the system will not store it in the database.



Employees Information Page:

This page contains information about the employee's status like their first name, last name, salary etc. The user can edit, delete and create the new employee using this page. The list is sorted by the category of employees. It is first displaying the CEO, then employees and at the last the managers.



Create New Employee Page:

This page is used to create a new employee. The application will ask the user to enter the first name, last name, salary scale and employee type. The employee can be CEO, Manager or employee. The application will first ask the user what type of employee he is going to create. If the type of employee is manager, the application will display name of CEO and list of other managers who can manage this manager.

LibraryInfoSystem.Web

Create New Employee

Go Back To Employees Page

First Name
dd

Last Name
dd

Salary Scale
0

Employee Type
Manager

Select Manager
Select Manager

Asad ASd
naeem ash
dan iel
Jobbler Khan

Activate Windows
Go to Settings to activate Windows.

Type here to search

8°C 10:32 PM 10/26/2022

As the employee is managed by any manager so it will display a list of managers to be selected for this employee.

LibraryInfoSystem.Web x +

localhost:5029/employee/create

LibraryInfoSystem.Web

Library Items

Categories

Employees

Create New Employee

Go Back To Employees Page

First Name

dd

Last Name

dd

Salary Scale

0

Employee Type

Employee

Select Manager

Select Manager

Select Manager

naeem ash

dan iel

Joblier Khan

Activate Windows

Go to Settings to activate Windows.

Type here to search

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If the type of the employee is CEO, it will do nothing as there can be no manager of the CEO. The application doesn't allow to create a CEO if an CEO already exists in the database.

LibraryInfoSystem.Web x +

localhost:5029/employee/create

LibraryInfoSystem.Web

Library Items

Categories

Employees

Create New Employee

Go Back To Employees Page

First Name

dd

Last Name

dd

Salary Scale

0

Employee Type

CEO

Create

Activate Windows

Go to Settings to activate Windows.

Type here to search

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Delete Employee:

The delete button that is present on the employee information page is used to delete the record of an employee. If type of the employee is manager or CEO and he is managing other managers or employees, it will not allow to delete it.

Test Run:

To run the application, following steps must be done:

```
"AllowedHosts": "*",  
"ConnectionStrings": {  
  "LibraryContext":  
    "Server=localhost;Database=Library;Trusted_Connection=True;MultipleActiveResultSets=true"  
}
```

- Run these entity framework commands for migration
- Add-Migration migration-name
- Update-database
- Seed the data manually in the tables
- In the client application, fix the port in program.cs file on which server is running
- Make both server and client projects as startup projects(if not).