.NET App Dev Hands-On Workshop

Blazor Lab 7 – State Management and JS Interop

This lab uses JavaScript Interop to save data to browser storage. Before starting this lab, you must have completed Blazor Lab 6.

Part 1: Add the ViewModel

- Create a new class named `DataInfo.cs` in the `ViewModels` folder of the `AutoLot.Models` project. Update the code to the following:

```
namespace AutoLot.Blazor.Models.ViewModels;
public class DataInfo
{
  public string Value { get; set; }
  public int Length { get; set; }
  public DateTime Timestamp { get; set; }
}
```

Part 2: Add the Services

Step 1: Add the storage service interface

- Create a new folder named `Storage` in the `Services` folder of the `AutoLot.Blazor` project. In this folder, add a new folder named `Interfaces`. In this folder, add an interface file named `IBrowserStorageService.cs`. Update the code to the following:

```
namespace AutoLot.Blazor.Services.Storage.Interfaces;

public interface IBrowserStorageService
{
  Task SetItemAsync<T>(string key, T item);
  Task<T> GetItemAsync<T>(string key);
}
```

- Add the following to the GlobalUsings.cs file in the `AutoLot.Blazor` project:

```
global using AutoLot.Blazor.Services.Storage;
global using AutoLot.Blazor.Services.Storage.Interfaces;
global using Microsoft.JSInterop;
global using System.Text.Json;
```

Step 2: Add the Local Storage service

- Add a new class named `LocalStorageService.cs` in the `Services\Storage` directory. Update the code to the following:

```
namespace AutoLot.Blazor.Services.Storage;

public class LocalStorageService(IJSRuntime jsRuntime) : IBrowserStorageService
{
  public async Task SetItemAsync<T>(string key, T item)
  {
    await jsRuntime.InvokeVoidAsync(
      "skimedicInterop.setLocalStorage", key, JsonSerializer.Serialize(item));
  }
  public async Task<T> GetItemAsync<T>(string key)
  {
    var json = await jsRuntime.InvokeAsync<string>("skimedicInterop.getLocalStorage", key);
    return json == null ? default : JsonSerializer.Deserialize<T>(json);
  }
}
```

Step 3: Add the Session Storage service.

- Add a new class named `SessionStorageService.cs` in the `Services\Storage` directory. Update the code to the following:

```
namespace AutoLot.Blazor.Services.Storage;

public class SessionStorageService(IJSRuntime jsRuntime) : IBrowserStorageService
{
  public async Task SetItemAsync<T>(string key, T item)
  {
    await jsRuntime.InvokeVoidAsync(
      "skimedicInterop.setSessionStorage", key, JsonSerializer.Serialize(item));
  }
  public async Task<T> GetItemAsync<T>(string key)
  {
    var json = await jsRuntime.InvokeAsync<string>("skimedicInterop.getSessionStorage", key);
    return json == null ? default : JsonSerializer.Deserialize<T>(json);
  }
}
```

Step 4: Add the services to the DI container.

- Add the following two lines to `Program.cs` after the other interface injections:

```
builder.Services
  .AddKeyedScoped<IBrowserStorageService, LocalStorageService>(nameof(LocalStorageService));
builder.Services
  .AddKeyedScoped<IBrowserStorageService, SessionStorageService>(nameof(SessionStorageService));
```


Part 3: Add the StateManangement Component and Page

Step 1: Add the StorageExample component

- Add a new component named `StorageExample.razor` into the `Shared` folder. Update the code to the following:

```
<h3>@Title</h3>
@FieldDisplayName:
<input type="text" @bind-value="_data" size="25" /><hr />
<button @onclick="SaveToLocalStorageAsync">Save to @StorageType Storage</button>
<button @onclick="ReadFromLocalStorageAsync">Read from @StorageType Storage</button>
<div class="mt-4">@_message</div>
@code {
  private string _data;
  private string _message;
  [Parameter][EditorRequired]public string Title { get; set; }
  [Parameter][EditorRequired]public string FieldDisplayName { get; set; }
  [Parameter][EditorRequired]public string StorageType { get; set; }
  [Parameter][EditorRequired]public EventCallback<string> OnDataReturnedCallback { get; set; }
  [Parameter][EditorRequired]
  public IBrowserStorageService StorageService { get; set; }
  async Task SaveToLocalStorageAsync()
  {
    var dataInfo = new DataInfo()
      {
        Value = _data,
        Length = _data!.Length,
        Timestamp = DateTime.Now
      };
    await StorageService!.SetItemAsync<DataInfo>("localStorageData", dataInfo);
    _message = "Saved";
  }
  async Task ReadFromLocalStorageAsync()
  {
    DataInfo savedData = await StorageService!.GetItemAsync<DataInfo>("localStorageData");
    string result = $"localStorageData = {savedData?.Value ?? "Missing"}";
    await OnDataReturnedCallback.InvokeAsync(result);
    _message = "";
  }
}
```

Step 2: Add the StateManagement Blazor Page

- Add a new page named `StateManagement.razor` into the `Pages` folder. Update the code to the following:

```
@page "/state-management"
<h1>State Management</h1>
<StorageExample Title="Local Storage"
  FieldDisplayName="localStorageData"
  StorageType="local"
  StorageService="LocalService"
  OnDataReturnedCallback="@(async (value) => { await Task.Yield(); await ShowData(value); })">
</StorageExample>
<StorageExample Title="Session Storage"
  FieldDisplayName="sessionStorageData"
  StorageType="session"
  StorageService="SessionService"
  OnDataReturnedCallback="@(async (value) => { await Task.Yield(); await ShowData(value); })">
</StorageExample>
@code {
  [Inject] private IJSRuntime JsRuntime { get; set; }
  private IJSObjectReference _module;
  //scoped to browser window
  [Inject(Key = nameof(LocalStorageService))]
  private IBrowserStorageService LocalService { get; set; }
  //scoped to browser tab
  [Inject(Key = nameof(SessionStorageService))]
  private IBrowserStorageService SessionService { get; set; }
  protected override async Task OnAfterRenderAsync(bool firstRender)
  {
    if (firstRender)
    {
      _module = await JsRuntime.InvokeAsync<IJSObjectReference>
        ("import", "./Pages/StateManagement.razor.js");
    }
  }
  async Task ShowData(string message)
  {
    if (_module is not null)
    {
      await _module.InvokeVoidAsync("showStorageData", message);
    }
  }
}
```


Part 4: Add the JavaScript Files

Step 1: Add the shared JavaScript file

- Add a new folder named `js` under the `wwwroot` folder, and in that folder, add a new JavaScript file named `interop.js`. Update the code to the following:

```
var skimedicInterop = {};
skimedicInterop.setLocalStorage = function (key, data) {
  //scoped to browser window
  localStorage.setItem(key, data);
}
skimedicInterop.getLocalStorage = function (key) {
  return localStorage.getItem(key);
}
skimedicInterop.setSessionStorage = function (key, data) {
  //scoped to browser tab
  sessionStorage.setItem(key, data);
}
skimedicInterop.getSessionStorage = function (key) {
  return sessionStorage.getItem(key);
}
```

- Update the `index.html` page to include the JavaScript file (just before the closing `body` tag):

```
<script src="js/interop.js"></script>
```

Step 2: Add the isolated JavaScript file

- Add a new JavaScript file named `StateManagement.razor.js`.into the `Pages` directory. Update the code to the following:

```
export function showStorageData(data) {
  alert(data);
}
```

Part 5: Update the Navigation

- Add the following as the last navigation entry in the `NavMenu.razor` component:

```
<NavLink class="nav-link" href="state-management">
  Session Storage <span class="fas fa-archive ps-2" aria-hidden="true"></span>
</NavLink>
```

Summary

This lab added JavaScript interop to save state into the browser.

Next Steps

The next lab will add in calls to `AutoLot.API` instead of using the local hard-coded data service classes.