

LABORATORY ASSIGNMENT №7

Building real-time web applications with SignalR

Goal: to gain hands-on experience integrating SignalR into a web application to enable real-time data exchange using SignalR.

Workflow:

Task.

Add SignalR to your MVC project developed in the previous labs. Implement real-time functionality according to the topic of your project (Table 1).

Table 1. Features to implement

Number on group list	Topic	Feature
1	Event Ticket Booking Website	Live updates on seat availability when users are choosing seats to book.

First, I've added *Seat* model:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace TicketBookingWebsite.Models
{
    public class Seat
    {
        public string Id { get; set; }
        public bool IsAvailable { get; set; } = true;
    }
}
```

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Then, I've created *SeatHub*, which handles sending seat update to all clients:

```
using Microsoft.AspNetCore.SignalR;
using System.Threading.Tasks;

namespace TicketBookingWebsite.Hubs
{
    public class SeatHub : Hub
    {
        public async Task NotifySeatUpdate(string seatId, bool isAvailable)
        {
            await Clients.All.SendAsync("ReceiveSeatUpdate", seatId, isAvailable);
        }
    }
}
```

Added Controller and View:

```
using Microsoft.AspNetCore.Authorization;
using Microsoft.AspNetCore.Mvc;
using System.Collections.Generic;
using System.Linq;
using TicketBookingWebsite.Models;

namespace TicketBookingWebsite.Controllers
{
    [Authorize]
    public class SeatsController : Controller
    {
        private static List<Seat> Seats = new List<Seat>
        {
            new Seat { Id = "A1", IsAvailable = true },
            new Seat { Id = "A2", IsAvailable = true },
            new Seat { Id = "A3", IsAvailable = true },
            new Seat { Id = "B1", IsAvailable = true },
            new Seat { Id = "B2", IsAvailable = true }
        };

        public IActionResult Index()
        {
            return View(Seats);
        }

        [HttpPost]
        public IActionResult Book(string id)
        {
            var seat = Seats.FirstOrDefault(s => s.Id == id);
            if (seat != null && seat.IsAvailable)
            {
                seat.IsAvailable = false;
            }

            return RedirectToAction("Index");
        }
    }
}
```

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```

@model List<Seat>

@{
    ViewData["Title"] = "Select Seats";
}

<h2>Select Your Seats</h2>

<div id="seat-container">
    @foreach (var seat in Model)
    {
        <button id="@seat.Id"
                class="seat @(seat.IsAvailable ? "available" : "unavailable")"
                onclick="selectSeat('@seat.Id')">
            @seat.Id
        </button>
    }
</div>

<script src="https://cdnjs.cloudflare.com/ajax/libs/microsoft-
signalr/7.0.5/signalr.min.js"></script>

<script>
    const connection = new signalR.HubConnectionBuilder()
        .withUrl("/seathub")
        .build();

    connection.on("ReceiveSeatUpdate", (seatId, isAvailable) => {
        const seat = document.getElementById(seatId);
        seat.classList.remove("available", "unavailable");
        seat.classList.add(isAvailable ? "available" : "unavailable");
        seat.disabled = !isAvailable;
    });

    connection.start().catch(err => console.error(err.toString()));

    function selectSeat(seatId) {
        fetch(`/Seats/Book?id=${seatId}`, { method: 'POST' })
            .then(() => connection.invoke("NotifySeatUpdate", seatId, false))
            .catch(err => console.error(err));
    }
</script>

<style>
    .seat {
        margin: 5px;
        padding: 10px 20px;
    }

    .available {
        background-color: green;
        color: white;
    }

    .unavailable {
        background-color: red;
        color: white;
    }
</style>

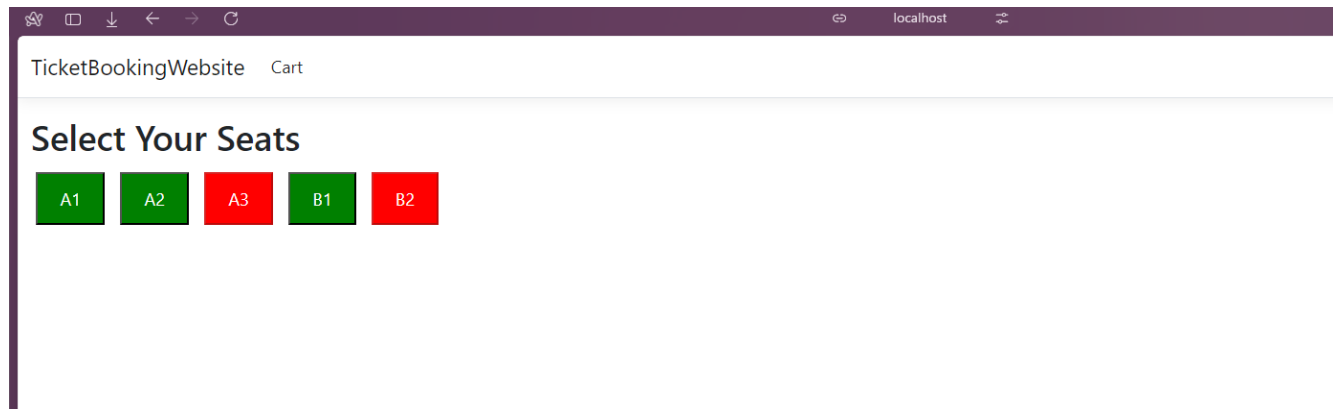
```

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And added this lines to Program.cs:

```
builder.Services.AddSignalR();
```

```
app.MapHub<SeatHub>("/seathub");
```



Conclusion: I've gained experience integrating SignalR into a web application to enable real-time data exchange using SignalR.

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