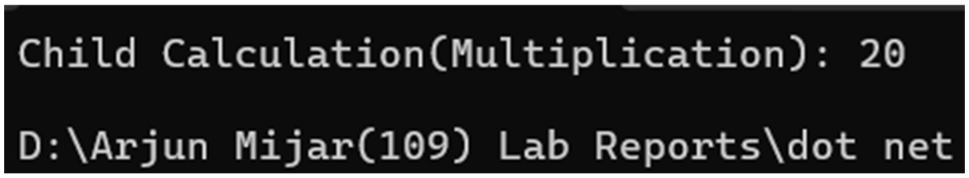
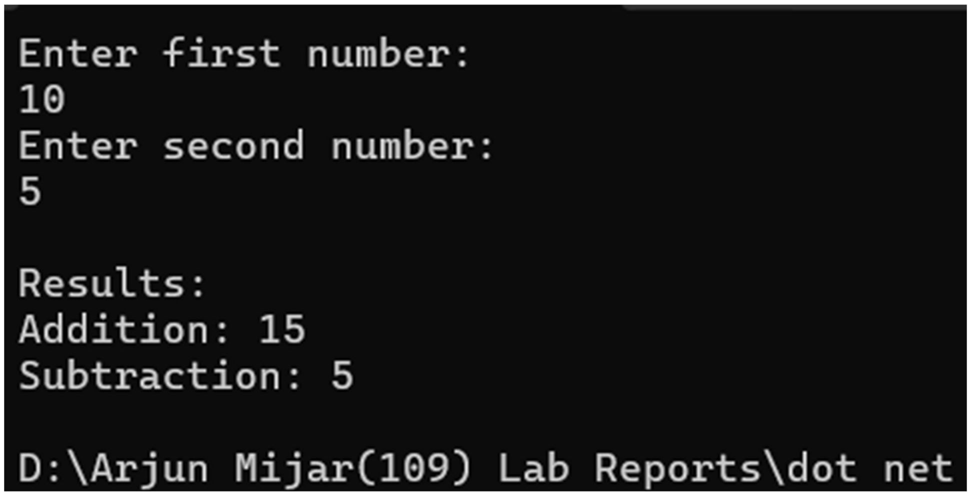
Output:(1)



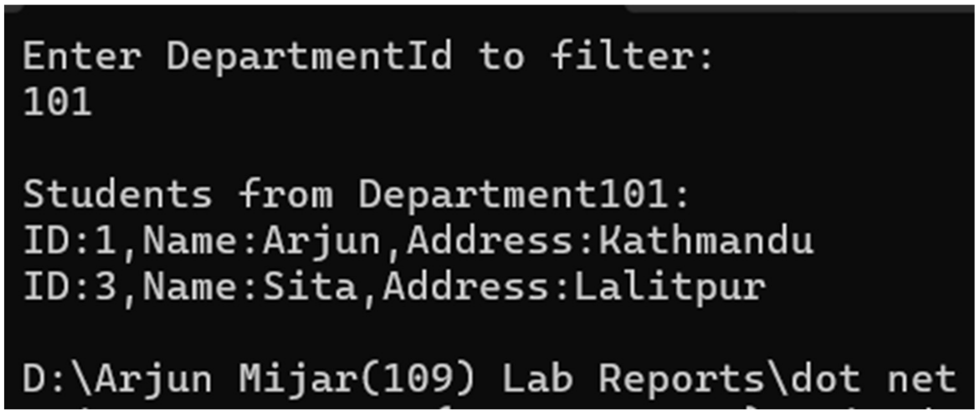
```
Child Calculation(Multiplication): 20

D:\Arjun Mijar(109) Lab Reports\dot net
```

Output:(2)



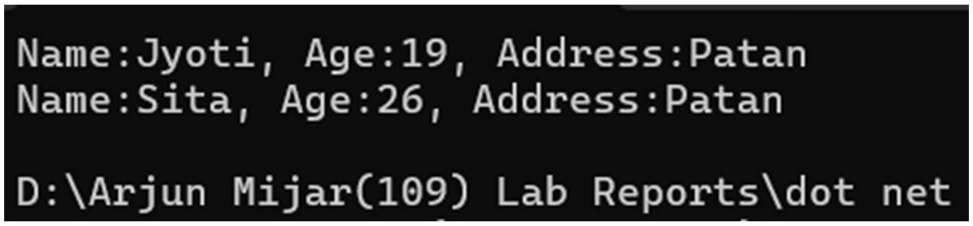
```
Enter first number:
10
Enter second number:
5

Results:
Addition: 15
Subtraction: 5

D:\Arjun Mijar(109) Lab Reports\dot net
```

Output:(3)

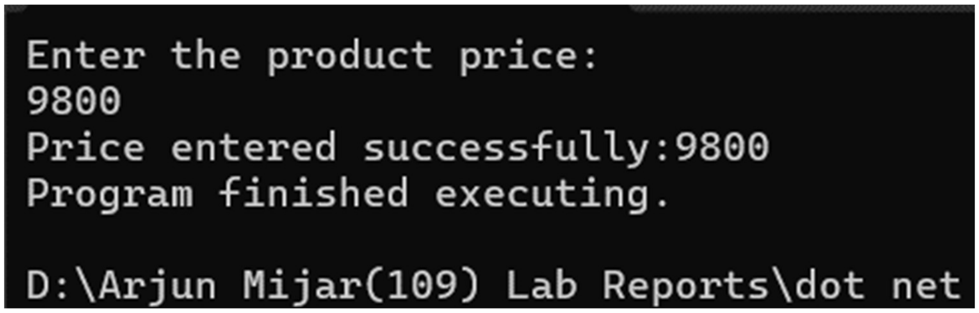


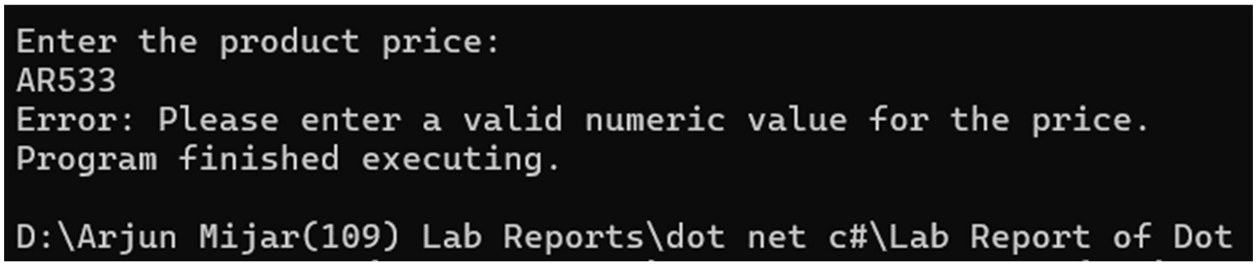
```
Enter DepartmentId to filter:
101

Students from Department101:
ID:1,Name:Arjun,Address:Kathmandu
ID:3,Name:Sita,Address:Lalitpur

D:\Arjun Mijar(109) Lab Reports\dot net
```

Output:(4)


```
Name:Jyoti, Age:19, Address:Patan
Name:Sita, Age:26, Address:Patan

D:\Arjun Mijar(109) Lab Reports\dot net
```

Output:(5)


```
Enter the product price:
9800
Price entered successfully:9800
Program finished executing.

D:\Arjun Mijar(109) Lab Reports\dot net
```


```
Enter the product price:
AR533
Error: Please enter a valid numeric value for the price.
Program finished executing.

D:\Arjun Mijar(109) Lab Reports\dot net c#\Lab Report of Dot
```

NET CENTRIC COMPUTING

TRIBHUVAN UNIVERSITY

AMRIT SCIENCE CAMPUS

Thamel, Kathmandu

Submitted By:
Arjun Mijar

Faculty: CSIT
Section: A
Combination: CSIT 6th Sem

Submitted To: Binod Thapa

Internal Examiner
Signature: ___________________

External Examiner
Signature: ___________________

INDEX

6. Define MVC. Write a crud operation to display, insert, update and delete Student information using ASP.NET CORE MVC.

MVC stands for **Model-View-Controller**, which is a **software design pattern** used for developing web and desktop applications. It separates an application into three interconnected components to **separate internal representations of information from the ways information is presented and accepted by the user**. This helps in organizing code, making it more maintainable and scalable.

explanation of each component:

1. **Model**
   - Represents the **data** and the **business logic** of the application.
   - Handles data retrieval, storage, and manipulation.
   - Example: Database records, calculations, validation logic.
2. **View**
   - Represents the **user interface** (UI) of the application.
   - Displays data from the Model to the user.
   - Example: HTML pages, UI forms, charts.
3. **Controller**
   - Handles **user input** and interactions.
   - Acts as a **bridge** between Model and View.
   - Updates the Model based on user input and selects which View to display.

Flow:
User → Controller → Model → View → User

Source Code:

Program.cs

```
using Microsoft.EntityFrameworkCore;
using Microsoft.AspNetCore;
using MVC_CRUD.Data;
using Microsoft.EntityFrameworkCore.SqlServer;
namespace MVC_CRUD
{
    public class Program
    {
        public static void Main(string[] args)
        {
            var builder = WebApplication.CreateBuilder(args);
            // Add MVC services
            builder.Services.AddControllersWithViews();
            // Add DbContext
            builder.Services.AddDbContext<ApplicationDbContext>(options =>
                options.UseSqlServer(
                    builder.Configuration.GetConnectionString("DefaultConnection"))
            );
            var app = builder.Build();
            // Middleware
            if (!app.Environment.IsDevelopment())
            {
                app.UseExceptionHandler("/Home/Error");
            }
            app.UseStaticFiles();
            app.UseRouting();
            app.UseAuthorization();
            // Default route
            app.MapControllerRoute(
                name: "default",
                pattern: "{controller=Students}/{action=Index}/{id?}");
            app.Run();
        }
    }
}
```

Data/ApplicationDbContext.cs

```
using Microsoft.EntityFrameworkCore;
using MVC_CRUD.Models;
namespace MVC_CRUD.Data
{
    public class ApplicationDbContext : DbContext
    {
        public ApplicationDbContext(DbContextOptions<ApplicationDbContext> options)
        : base(options)
        {
        }
        public DbSet<Student> Students { get; set; }
    }
}
```

appsetting.json

```
{
  "ConnectionStrings": {
    "DefaultConnection":
"Server=.\\SQLEXPRESS;Database=StudentDB;Trusted_Connection=True;TrustServerCertific
ate=True"
  },
  "Logging": {
    "LogLevel": {
      "Default": "Information",
      "Microsoft.AspNetCore": "Warning"
    }
  },
  "AllowedHosts": "*"
}
```

Controller/StudentsController.cs

```
using Microsoft.AspNetCore.Mvc;
using Microsoft.EntityFrameworkCore;
using MVC_CRUD.Data;
using MVC_CRUD.Models;
using System.Threading.Tasks;
using static MVC_CRUD.Models.Student;
namespace MVC_CRUD.Controllers
{
    public class StudentsController : Controller
    {
        private readonly ApplicationDbContext _context;

        public StudentsController(ApplicationDbContext context)
        {
            _context = context;
        }
        // READ
        public async Task<IActionResult> Index()
        {
            return View(await _context.Students.ToListAsync());
        }

        // CREATE - GET
        public IActionResult Create()
        {
            return View();
        }
        // CREATE - POST
        [HttpPost]
        public async Task<IActionResult> Create(Student student)
        {
            if (ModelState.IsValid)
            {
                _context.Students.Add(student);
                await _context.SaveChangesAsync();
                return RedirectToAction("Index");
            }
            return View(student);
        }
        // UPDATE - GET
        public async Task<IActionResult> Edit(int id)
        {
            var student = await _context.Students.FindAsync(id);
            return View(student);
        }
        // UPDATE - POST
        [HttpPost]
        public async Task<IActionResult> Edit(Student student)
        {
            if (ModelState.IsValid)
            {
                _context.Students.Update(student);
                await _context.SaveChangesAsync();
                return RedirectToAction("Index");
            }
            return View(student);
        }
        // DELETE - GET
        public async Task<IActionResult> Delete(int id)
        {
            var student = await _context.Students.FindAsync(id);
            return View(student);
        }
        // DELETE - POST
        [HttpPost, ActionName("Delete")]
        public async Task<IActionResult> DeleteConfirmed(int id)
        {
            var student = await _context.Students.FindAsync(id);
            _context.Students.Remove(student);
            await _context.SaveChangesAsync();
            return RedirectToAction("Index");
        }
    }
}
```

Models/Student.cs

```
using System.ComponentModel.DataAnnotations;
namespace MVC_CRUD.Models
{
    public class Student
    {
        public int Id { get; set; }
        [Required]
        public string Name { get; set; }
        public int Age { get; set; }
        [EmailAddress]
        public string Email { get; set; }
    }
}
```

Views/Students/Index.cshtml

```
@model IEnumerable<Student>
<a asp-action="Create">Add Student</a>
<table border="1">
    <tr>
        <th>Name</th>
        <th>Age</th>
        <th>Email</th>
        <th>Actions</th>
    </tr>
    @foreach (var s in Model)
    {
        <tr>
            <td>@s.Name</td>
            <td>@s.Age</td>
            <td>@s.Email</td>
            <td>
                <a asp-action="Edit" asp-route-id="@s.Id">Edit</a> |
                <a asp-action="Delete" asp-route-id="@s.Id">Delete</a>
            </td>
        </tr>
    }
</table>
```

Views/Students/Create.cshtml

```
@model Student
<form asp-action="Create" method="post">
    Name: <input asp-for="Name" /><br />
    Age: <input asp-for="Age" /><br />
    Email: <input asp-for="Email" /><br />
    <button type="submit">Save</button>
</form>
```

Views/Students/Edit.cshtml

```
@model Student
<form asp-action="Edit" method="post">
    <input type="hidden" asp-for="Id" />
    Name: <input asp-for="Name" /><br />
    Age: <input asp-for="Age" /><br />
    Email: <input asp-for="Email" /><br />
    <button type="submit">Update</button>
</form>
```

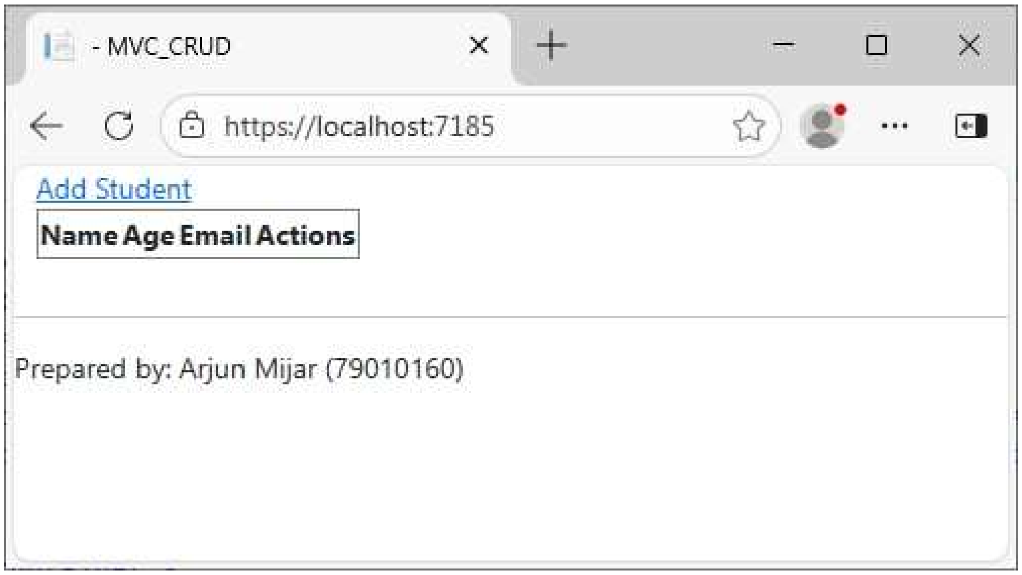
Views/Students/Delete.cshtml

```
@model Student
<h3>Are you sure?</h3>
<form asp-action="Delete" method="post">
    <input type="hidden" asp-for="Id" />
    <button type="submit">Delete</button>
</form>
```

Views/Shared/_Layout.cshtml

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"] - MVC_CRUD</title>
    <script type="importmap"></script>
</head>
<body>
    <div class="container">
        <main role="main" class="pb-3">
            @RenderBody()
        </main>
    </div>
<hr>
<p>Prepared by: Arjun Mijar (79010160)</p>
</body>
</html>
```

Output:

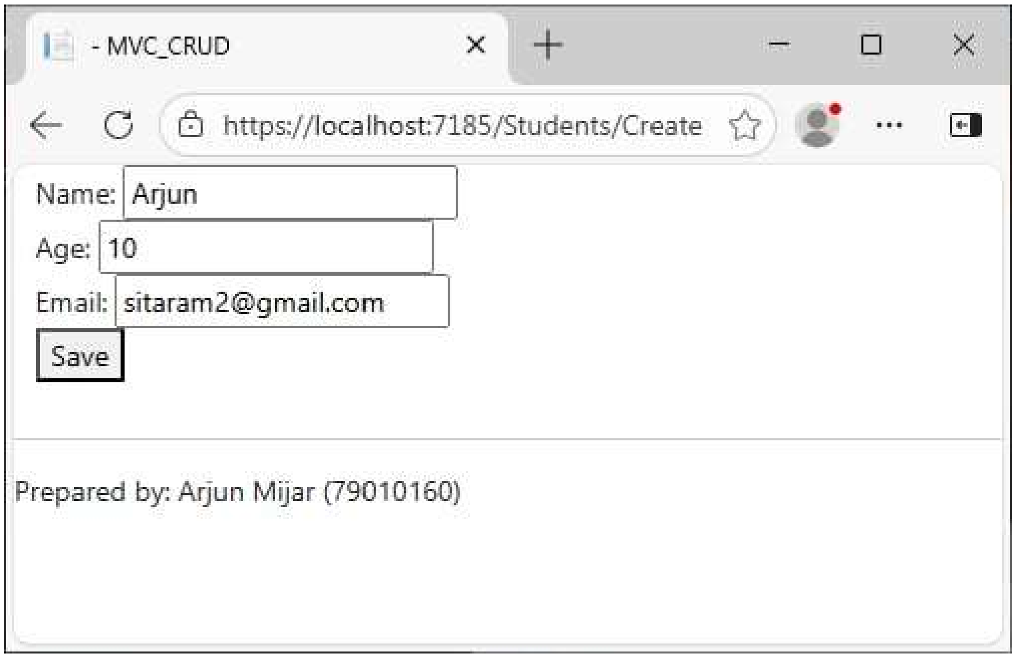

- MVC_CRUD

https://localhost:7185

Add Student

Name Age Email Actions

Prepared by: Arjun Mijar (79010160)


- MVC_CRUD

https://localhost:7185/Students/Create

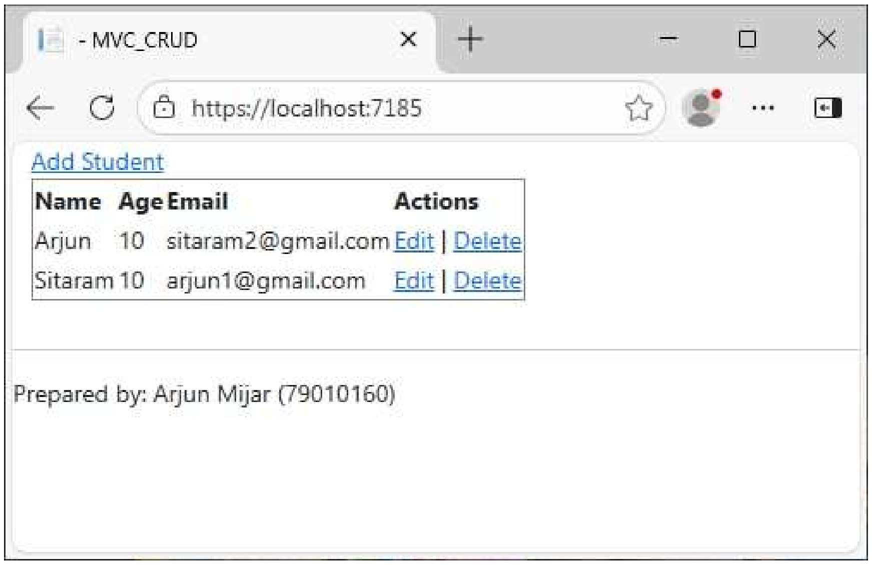
Name: Arjun

Age: 10

Email: sitaram2@gmail.com

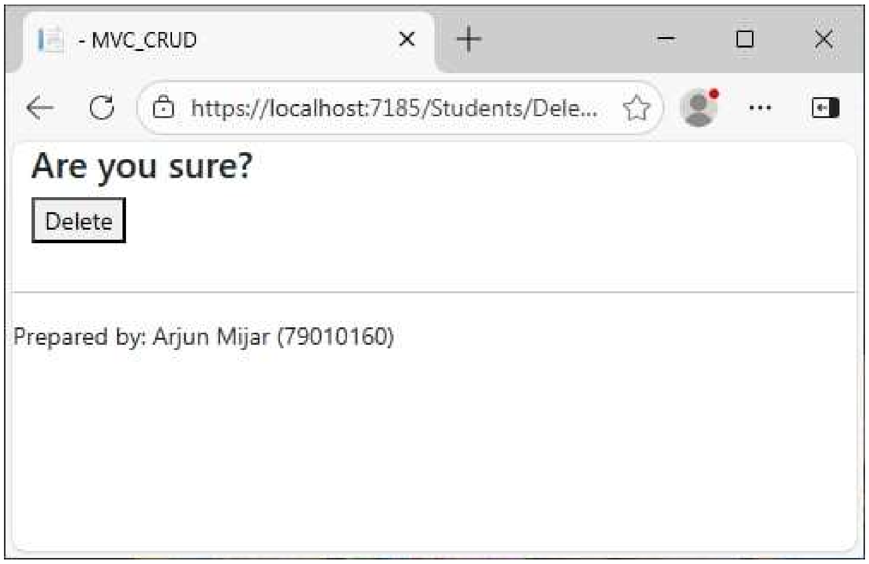
Save

Prepared by: Arjun Mijar (79010160)



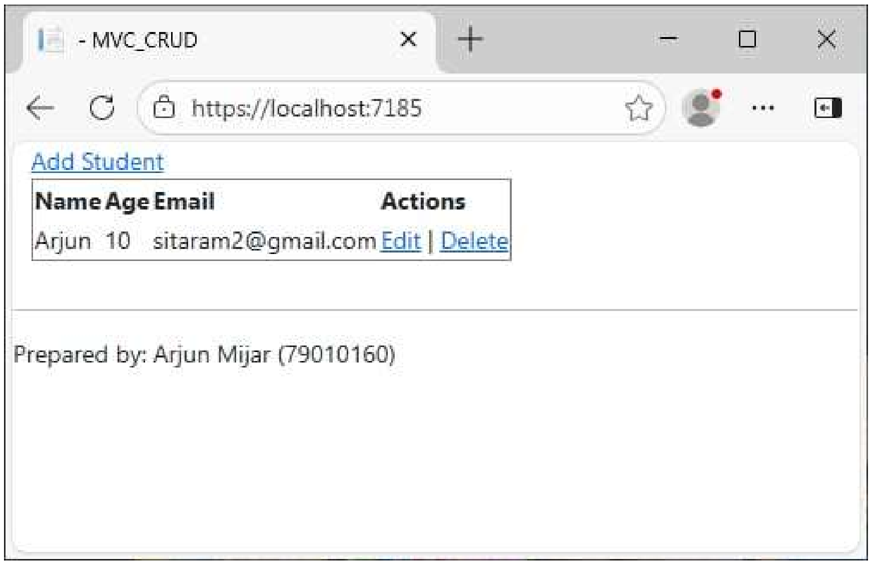
Name	Age	Email	Actions
Arjun	10	sitaram2@gmail.com	Edit | Delete
Sitaram	10	arjun1@gmail.com	Edit | Delete

Prepared by: Arjun Mijar (79010160)



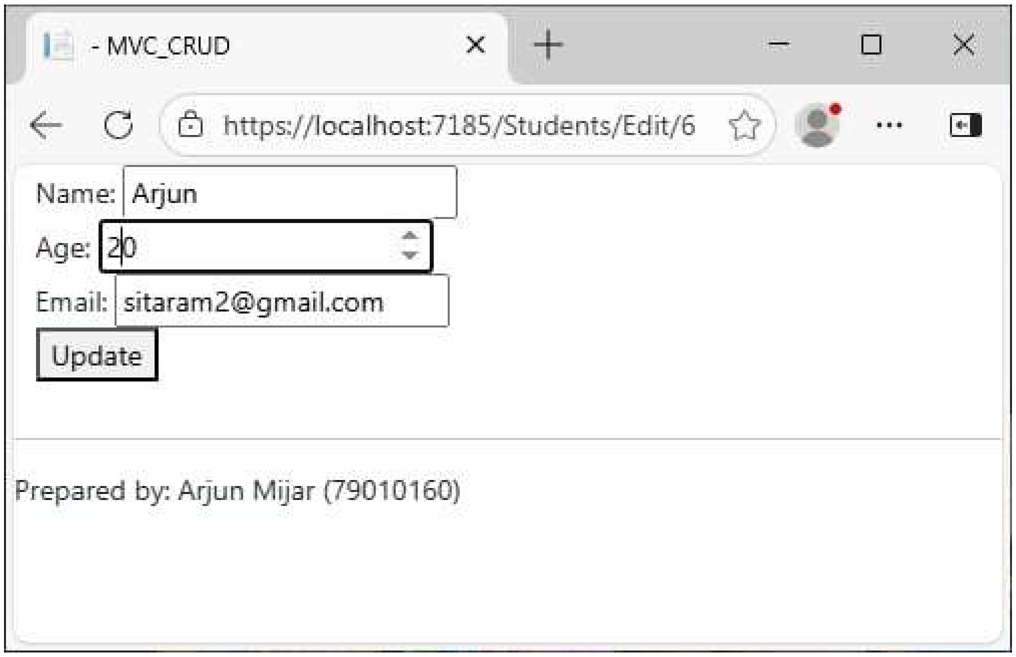
Are you sure?

Prepared by: Arjun Mijar (79010160)



Name	Age	Email	Actions
Arjun	10	sitaram2@gmail.com	Edit | Delete

Prepared by: Arjun Mijar (79010160)



- MVC_CRUD

https://localhost:7185/Students/Edit/6

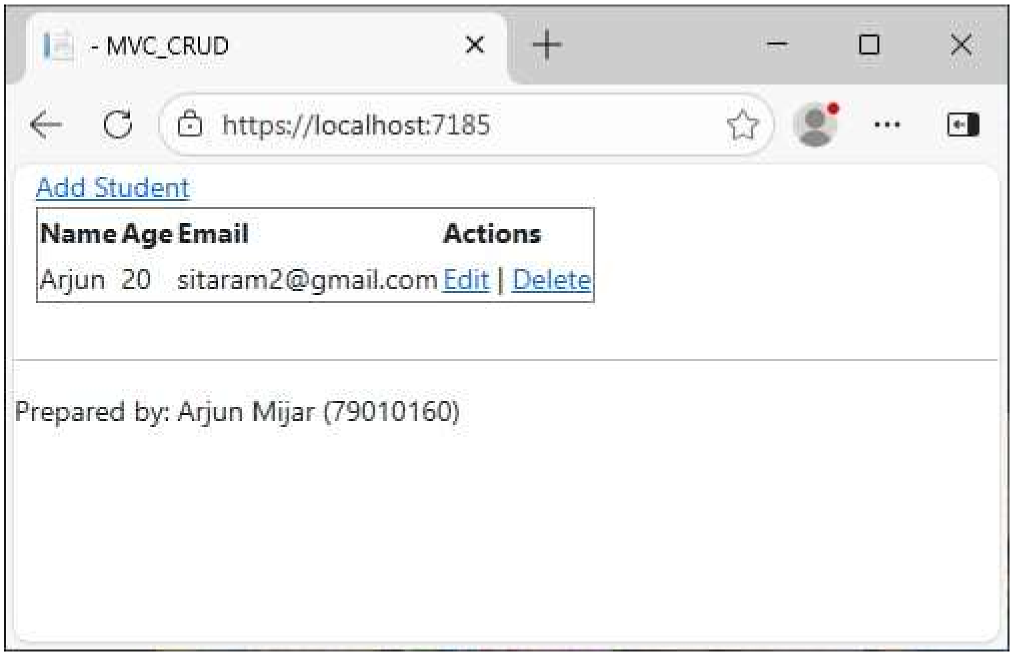
Name: Arjun

Age: 20

Email: sitaram2@gmail.com

Update

Prepared by: Arjun Mijar (79010160)



- MVC_CRUD

https://localhost:7185

Add Student

Name	Age	Email	Actions
Arjun	20	sitaram2@gmail.com	Edit | Delete

Prepared by: Arjun Mijar (79010160)

7. What Data annotation? Write a program to validate Player information when click on save button using MVC pattern.

Data Annotation is a technique in **C# / ASP.NET** used to **add metadata to class properties**. It helps in **validating data**, **formatting how data is displayed**, and sometimes in **defining relationships** between data fields. Essentially, it provides **rules and instructions** to the framework about how to handle the data in models.

Source Code:

Models/Player.cs

```
using System;
using System.ComponentModel.DataAnnotations;
namespace MyApp.Models
{
    public class Player
    {
        public int Id { get; set; }
        [Required(ErrorMessage = "Player name is required.")]
        [StringLength(50, ErrorMessage = "Name can't be longer than 50
characters.")]
        public string Name { get; set; }
        [Required(ErrorMessage = "Email is required.")]
        [EmailAddress(ErrorMessage = "Enter a valid email address.")]
        public string Email { get; set; }
        [Required(ErrorMessage = "Jersey number is required.")]
        [Range(1, 99, ErrorMessage = "Jersey number must be between 1 and 99.")]
        public int JerseyNumber { get; set; }
        [Required(ErrorMessage = "Position is required.")]
        [StringLength(30)]
        public string Position { get; set; }
        [Required(ErrorMessage = "Date of birth is required.")]
        [DataType(DataType.Date)]
        [MinimumAge(18, ErrorMessage = "Player must be at least 18 years old.")]
        public DateTime DateOfBirth { get; set; }

        [Range(0, double.MaxValue, ErrorMessage = "Salary must be non-negative.")]
        public decimal Salary { get; set; }
    }
    // Custom validation attribute (server-side)
    public class MinimumAgeAttribute : ValidationAttribute
    {
        private readonly int _minAge;

        public MinimumAgeAttribute(int minAge)
        {
            _minAge = minAge;
        }
        protected override ValidationResult IsValid(object value, ValidationContext
validationContext)
        {
            if (value == null)
                return new ValidationResult(ErrorMessage ?? $"Minimum age is
{_minAge}.");
            if (value is DateTime dob)
            {
                var today = DateTime.Today;
                int age = today.Year - dob.Year;
                if (dob > today.AddYears(-age)) age--;
                return (age >= _minAge)
                    ? ValidationResult.Success
                    : new ValidationResult(ErrorMessage ?? $"Minimum age is
{_minAge}.");
            }
            return new ValidationResult("Invalid date");
        }
    }
}
```

Controllers/PlayersController.cs

```
using Microsoft.AspNetCore.Mvc;
using MyApp.Models;
using System.Collections.Generic;
namespace MyApp.Controllers
{
    public class PlayersController : Controller
    {
        // Temp in-memory store for example; in production use DB
        private static readonly List<Player> _players = new List<Player>();
        // GET: /Players/Create
        public IActionResult Create()
        {
            return View();
        }
        // POST: /Players/Create
        [HttpPost]
        [ValidateAntiForgeryToken]
        public IActionResult Create(Player player)
        {
            // Model binding happens before this and DataAnnotations are evaluated.
            if (!ModelState.IsValid)
            {
                // If validation failed, return the same view with the model so
validation messages are displayed.
                return View(player);
            }
            // Simulate saving to DB
            player.Id = _players.Count + 1;
            _players.Add(player);
            // Redirect after POST to avoid resubmission; could go to Details/Index.
            return RedirectToAction(nameof(Index));
        }
        // GET: /Players
        public IActionResult Index()
        {
            return View(_players);
        }
    }
}
```

Views/Player/Create.cshtml

```
@model MyApp.Models.Player
@{
    ViewData["Title"] = "Create a new character";
}

<h2>Add Player</h2>
<form asp-action="Create" method="post" class="needs-validation" novalidate>
    <div asp-validation-summary="ModelOnly" class="text-danger"></div>
    <div class="form-group">
        <label asp-for="Name"></label>
        <input asp-for="Name" class="form-control" />
        <span asp-validation-for="Name" class="text-danger"></span>
    </div>
    <div class="form-group">
        <label asp-for="Email"></label>
        <input asp-for="Email" class="form-control" />
        <span asp-validation-for="Email" class="text-danger"></span>
    </div>
    <div class="form-group">
        <label asp-for="JerseyNumber"></label>
        <input asp-for="JerseyNumber" class="form-control" type="number" />
        <span asp-validation-for="JerseyNumber" class="text-danger"></span>
    </div>
    <div class="form-group">
        <label asp-for="Position"></label>
        <input asp-for="Position" class="form-control" />
        <span asp-validation-for="Position" class="text-danger"></span>
    </div>
    <div class="form-group">
        <label asp-for="DateOfBirth"></label>
        <input asp-for="DateOfBirth" class="form-control" type="date" />
        <span asp-validation-for="DateOfBirth" class="text-danger"></span>
    </div>
    <div class="form-group">
        <label asp-for="Salary"></label>
        <input asp-for="Salary" class="form-control" type="number" step="0.01" />
        <span asp-validation-for="Salary" class="text-danger"></span>
    </div>
    <button type="submit" class="btn btn-primary">Save</button>
</form>
@section Scripts {
    @{await Html.RenderPartialAsync("_ValidationScriptsPartial");}
}
```

Views/Players/Index.cshtml

```
@model IEnumerable<MyApp.Models.Player>
@{
    ViewData["Title"] = "Characters List";
}
<h2>Players List</h2>
<p>
    <a asp-action="Create"> Create a new character</a>
</p>
```

```
@if (!Model.Any())
{
    <p>No players have been added yet.</p>
}
else
{
    <table>
        <thead>
            <tr>
                <th>Name</th>
                <th>Email</th>
                <th>Jersey Number</th>
                <th>Position</th>
                <th>Date of Birth</th>
                <th>Salary</th>
            </tr>
        </thead>
        <tbody>
            @foreach (var player in Model)
            {
                <tr>
                    <td>@player.Name</td>
                    <td>@player.Email</td>
                    <td>@player.JerseyNumber</td>
                    <td>@player.Position</td>
                    <td>@player.DateOfBirth.ToString("yyyy-MM-dd")</td>
                    <td>@player.Salary.ToString("C")</td>
                </tr>
            }
        </tbody>
    </table>
}
```

Program.cs

```
namespace Data_Annotation
{
    public class Program
    {
        public static void Main(string[] args)
        {
            var builder = WebApplication.CreateBuilder(args);
            // Add services to the container.
            builder.Services.AddControllersWithViews();
            var app = builder.Build();
            // Configure the HTTP request pipeline.
            if (!app.Environment.IsDevelopment())
            {
                app.UseExceptionHandler("/Home/Error");
                app.UseHsts();
            }
            app.UseHttpsRedirection();
            app.UseStaticFiles();
            app.UseRouting();
            app.UseAuthorization();
            app.MapControllerRoute(
                name: "default",
                pattern: "{controller=Players}/{action=Index}/{id?}");
            app.Run();
        }
    }
}
```

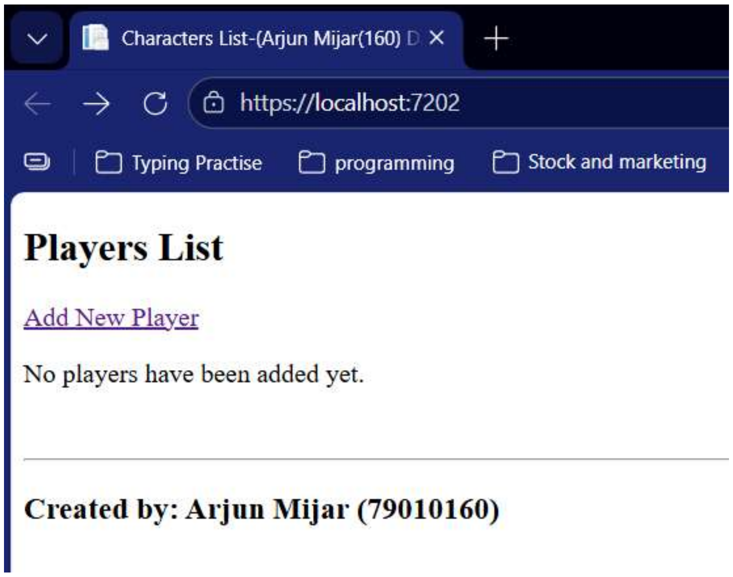
Views/Shared/_Layout.cshtml

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"] -(Arjun Mijar(160) Data_Annotation</title>
</head>
<body>
    <div class="container">
        <main role="main" class="pb-3">
            @RenderBody()
        </main>
    </div>
    <script src="~/lib/jquery/dist/jquery.min.js"></script>
    <script src="~/lib/bootstrap/dist/js/bootstrap.bundle.min.js"></script>
    <script src="~/js/site.js" asp-append-version="true"></script>
    @await RenderSectionAsync("Scripts", required: false)
</body>
</html>
```

wwwroot/css/site.cs

```
table, th, td {
    border: 1px solid #000;
}
```

<u>Output:</u>



Characters List-(Arjun Mijar(160) D

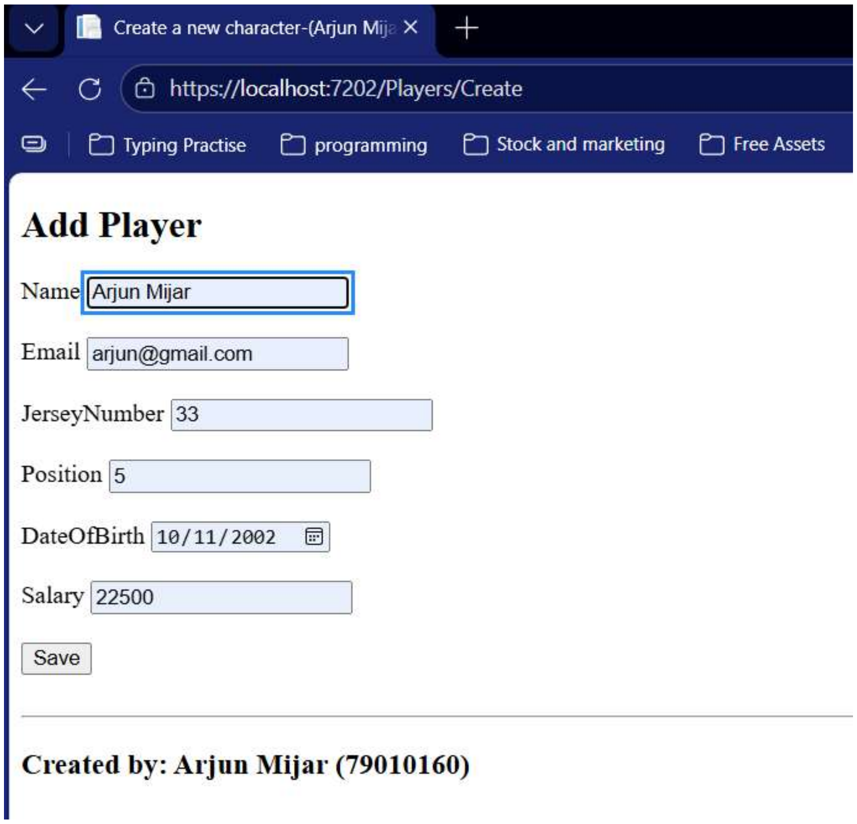
https://localhost:7202

Players List

Add New Player

No players have been added yet.

Created by: Arjun Mijar (79010160)



Create a new character-(Arjun Mija

https://localhost:7202/Players/Create

Add Player

Name Arjun Mijar

Email arjun@gmail.com

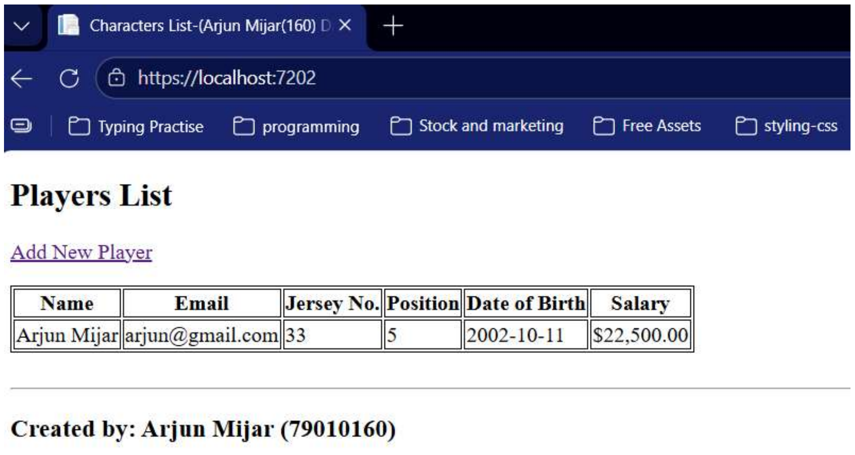
JerseyNumber 33

Position 5

DateOfBirth 10/11/2002

Salary 22500

Created by: Arjun Mijar (79010160)

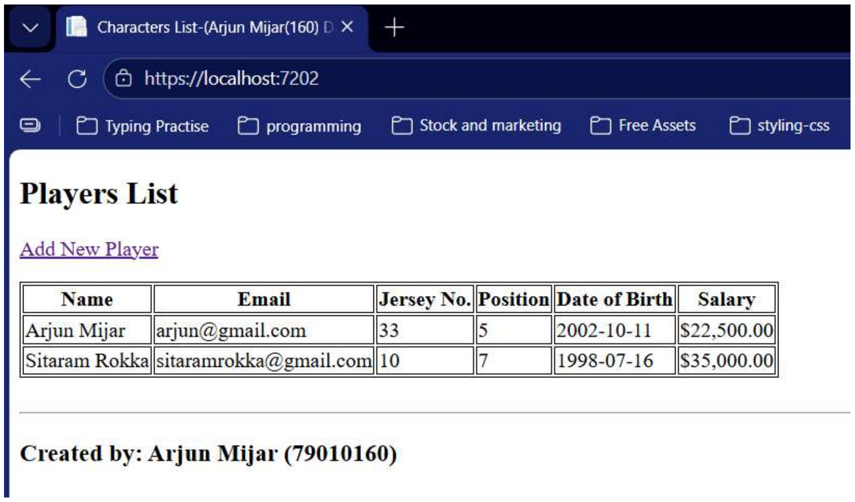


Players List

Add New Player

Name	Email	Jersey No.	Position	Date of Birth	Salary
Arjun Mijar	arjun@gmail.com	33	5	2002-10-11	$22,500.00

Created by: Arjun Mijar (79010160)



Players List

Add New Player

Name	Email	Jersey No.	Position	Date of Birth	Salary
Arjun Mijar	arjun@gmail.com	33	5	2002-10-11	$22,500.00
Sitaram Rokka	sitaramrokka@gmail.com	10	7	1998-07-16	$35,000.00

Created by: Arjun Mijar (79010160)

8. Define Authentication. Write a program to implement Authentication and Authorization using User Roles.

Authentication is the process of **verifying the identity of a user or system** before granting access to resources. It ensures that **the person or entity is who they claim to be**.

Key points:

- Confirms identity.
- Often uses **username/password**, **OTP**, **biometrics**, or **tokens**.
- Different from **Authorization**, which decides **what the user can access** after authentication.

Source Code:

Controller/AccountController.cs

```
using Microsoft.AspNetCore.Identity;
using Microsoft.AspNetCore.Mvc;
using Authentication_Authorization.Models;
using Microsoft.EntityFrameworkCore.Metadata.Internal;
using Authentication_Authorization.ViewModels;
namespace Authentication_Authorization.Controllers
{
    public class AccountController : Controller
    {
        private readonly UserManager<ApplicationUser> _userManager;
        private readonly SignInManager<ApplicationUser> _signInManager;
        public AccountController(UserManager<ApplicationUser> userManager,
SignInManager<ApplicationUser> signInManager)
        {
            _userManager = userManager;
            _signInManager = signInManager;
        }
        [HttpGet]
        public IActionResult Register() => View();
        [HttpPost]
        public async Task<IActionResult> Register(RegisterViewModel model)
        {
            if (ModelState.IsValid)
            {
                var user = new ApplicationUser { UserName = model.Email, Email =
model.Email };
                var result = await _userManager.CreateAsync(user, model.Password);
                if (result.Succeeded)
                {
                    await _userManager.AddToRoleAsync(user, "User");
                    await _signInManager.SignInAsync(user, false);
                    return RedirectToAction("Index", "Home");
                }
                foreach (var error in result.Errors)
```

```
                    ModelState.AddModelError("", error.Description);
                }
                return View(model);
            }
            [HttpGet]
            public IActionResult Login() => View();
            [HttpPost]
            [ValidateAntiForgeryToken]
            public async Task<IActionResult> Login(LoginViewModel model)
            {
                if (ModelState.IsValid)
                {
                    var user = await _userManager.FindByEmailAsync(model.Email);
                    if(user !=null & !await _userManager.IsEmailConfirmedAsync(user))
                    {
                        ModelState.AddModelError("", "You need to confirm your email
before logging in.");
                        return View(model);
                    }
                    var result = await _signInManager.PasswordSignInAsync(model.Email,
model.Password, false, false);
                    if (result.Succeeded)
                    {
                        if (await _userManager.IsInRoleAsync(user, "Admin"))
                        {
                            return RedirectToAction("Admin", "Dashboard");
                        }
                        else if (await _userManager.IsInRoleAsync(user, "User"))
                        {
                            return RedirectToAction("User", "Dashboard");
                        }
                        else
                        {
                            return RedirectToAction("Index", "Home");
                        }
                    }
                    ModelState.AddModelError("", "Invalid Login Attempt");
                }
                return View(model);
            }
            public async Task<IActionResult> Logout()
            {
                await _signInManager.SignOutAsync();
                return RedirectToAction("Index", "Home");
            }
        }
    }
```

Controller/DashboardController.cs

```
using Microsoft.AspNetCore.Authorization;
using Microsoft.AspNetCore.Mvc;
namespace Authentication_Authorization.Controllers
{
    public class DashboardController : Controller
    {
        // Accessible only by Admin role
        [Authorize(Roles = "Admin")]
        public IActionResult Admin()
        {
            return View();
        }
        // Accessible only by Users role
        [Authorize(Roles = "User")]
        public IActionResult User()
        {
            return View();
        }
        // Accessible by Admin and User role
        [Authorize(Roles = "Admin, User")]
        public IActionResult Common()
        {
            return View();
        }
    }
}
```

Data/ApplicationDbContext.cs

```
using Microsoft.AspNetCore.Identity.EntityFrameworkCore;
using Microsoft.EntityFrameworkCore;
using Authentication_Authorization.Models;

namespace Authentication_Authorization.Data
{
    public class ApplicationDbContext : IdentityDbContext<ApplicationUser>
    {
        public ApplicationDbContext(DbContextOptions<ApplicationDbContext> options)
            : base(options)
        {
        }
    }
}
```

Models/ApplicationUser.cs

```
using Microsoft.AspNetCore.Identity;
namespace Authentication_Authorization.Models
{
    public class ApplicationUser : IdentityUser
    {
    }
}
```

ViewModels/LoginViewModel.cs

```
using System.ComponentModel.DataAnnotations;
namespace Authentication_Authorization.ViewModels
```

```
{
    public class LoginViewModel
    {
        [Required]
        [EmailAddress]
        public required string Email { get; set; }
        [Required]
        [DataType(DataType.Password)]
        public required string Password { get; set; }
    }
}
```

ViewModels/RegisterViewModel.cs

```
using System.ComponentModel.DataAnnotations;
namespace Authentication_Authorization.ViewModels
{
    public class RegisterViewModel
    {
        [Required]
        [EmailAddress]
        public required string Email { get; set; }
        [Required]
        [DataType(DataType.Password)]
        public required string Password { get; set; }
        [DataType(DataType.Password)]
        [Compare("Password", ErrorMessage = "Passwords do not match")]
        public required string ConfirmPassword { get; set; }
    }
}
```

Views/Account/Login.cshtml

```
@model Authentication_Authorization.ViewModels.LoginViewModel
@{
    ViewData["Title"] = "Login";
}
<h2>Login</h2>
<form asp-action="Login" method="post">
<div class="form-group">
<label asp-for="Email"></label>
<input asp-for="Email" class="form-control" />
<span asp-validation-for="Email" class="text-danger"></span>
</div>
<div class="form-group">
<label asp-for="Password"></label>
<input asp-for="Password" type="password" class="form-control" />
<span asp-validation-for="Password" class="text-danger"></span>
</div>
<button type="submit" class="btn btn-primary">Login</button>
</form>
@section Scripts {
    <partial name="_ValidationScriptsPartial"></partial>
}
```

Views/Account/Register.cshtml

```
@model Authentication_Authorization.ViewModels.RegisterViewModel
@{
    ViewData["Title"] = "Register";
}
<h2 class="text-center mb-4">Register</h2>

<div class="row justify-content-center">
    <div class="col-md-6">
        <div class="card shadow-lg p-4 rounded-3">
            <form asp-action="Register" method="post">
                <div asp-validation-summary="ModelOnly" class="text-danger"></div>
                <!-- Email -->
                <div class="form-group mb-3">
                    <label asp-for="Email" class="form-label"></label>
                    <input asp-for="Email" class="form-control" placeholder="Enter
your email" />
                    <span asp-validation-for="Email" class="text-danger"></span>
                </div>
                <!-- Password -->
                <div class="form-group mb-3">
                    <label asp-for="Password" class="form-label"></label>
                    <input asp-for="Password" type="password" class="form-control"
placeholder="Enter password" />
                    <span asp-validation-for="Password" class="text-danger"></span>
                </div>
                <!-- Confirm Password -->
                <div class="form-group mb-4">
                    <label asp-for="ConfirmPassword" class="form-label"></label>
                    <input asp-for="ConfirmPassword" type="password" class="form-
control" placeholder="Confirm password" />
                    <span asp-validation-for="ConfirmPassword" class="text-
danger"></span>
                </div>
                <div class="text-center">
                    <button type="submit" class="btn btn-primary px-
4">Register</button>
                </div>
            </form>
            <div class="text-center mt-3">
                <p>Already have an account? <a asp-controller="Account" asp-
action="Login">Login here</a></p>
            </div>
        </div>
    </div>
</div>

@section Scripts {
    <partial name="_ValidationScriptsPartial" />
}
```

Views/Dashboard/Admin.cshtml

```
@{
    ViewData["Title"] = "Administration Interface";
}
<h2>Administration Interface</h2>
<p>Welcome, Administration!, You can manage the system from here.</p>
```

Views/Dashboard/User.cshtml

```
@{
    ViewData["Title"] = "User Interface";
}
<h2>User Interface</h2>
<p>Welcome, User!, You can view your personal data here.</p>
```

Views/Dashboard/Common.cshtml

```
@{
    ViewData["Title"] = "Common Interface";
}
<h2>Common Interface</h2>
<p>Both Admin and User roles can see this page.</p>
```

Views/Shared/_Layout.cshtml

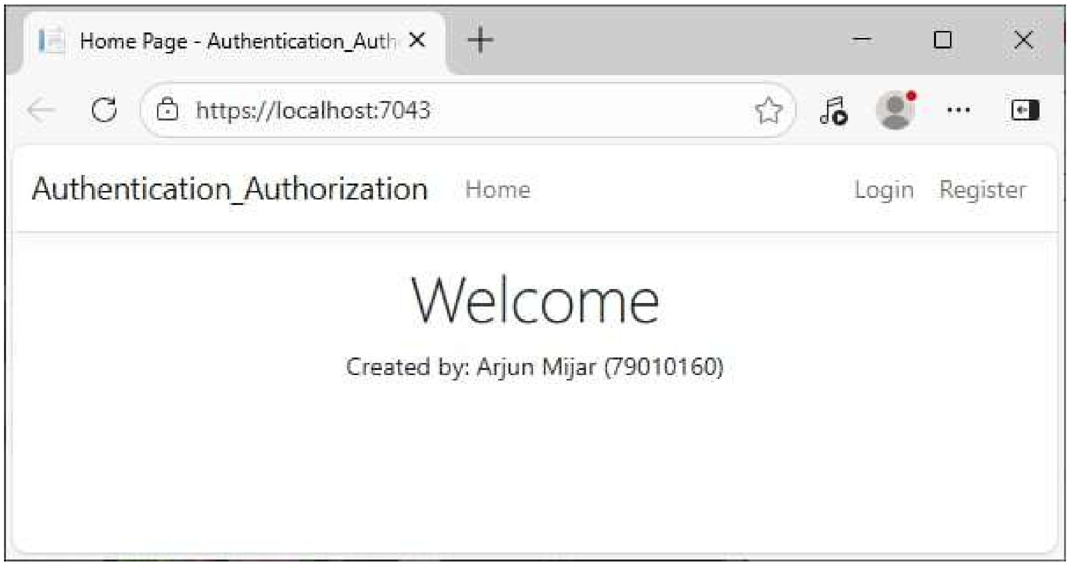
```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"] - Authentication_Authorization</title>
    <link rel="stylesheet" href="~/lib/bootstrap/dist/css/bootstrap.min.css" />
    <link rel="stylesheet" href="~/css/site.css" asp-append-version="true" />
    <link rel="stylesheet" href="~/Authentication_Authorization.styles.css" asp-
append-version="true" />
</head>
<body>
    <header>
        <nav class="navbar navbar-expand-sm navbar-toggleable-sm navbar-light bg-
white border-bottom box-shadow mb-3">
            <div class="container-fluid">
                <a class="navbar-brand" asp-area="" asp-controller="Home" asp-
action="Index">Authentication_Authorization</a>
                <button class="navbar-toggler" type="button" data-bs-
toggle="collapse" data-bs-target=".navbar-collapse" aria-
controls="navbarSupportedContent"
                        aria-expanded="false" aria-label="Toggle navigation">
                    <span class="navbar-toggler-icon"></span>
                </button>
                <div class="collapse navbar-collapse" id="navbarNav">
                <ul class="navbar-nav me-auto">
```

```
                    <li class="nav-item">
                        <a class="nav-link" asp-controller="Home" asp-
action="Index">Home</a>
                    </li>
                    @* Role-based links *@
                    @if (User.IsInRole("Admin"))
                    {
                        <li class="nav-item">
                            <a class="nav-link" asp-controller="Dashboard" asp-
action="Admin">Admin Dashboard</a>
                        </li>
                    }
                    @if (User.IsInRole("User"))
                    {
                        <li class="nav-item">
                            <a class="nav-link" asp-controller="Dashboard" asp-
action="User">User Dashboard</a>
                        </li>
                    }
                    @if (User.IsInRole("Admin") || User.IsInRole("User"))
                    {
                        <li class="nav-item">
                            <a class="nav-link" asp-controller="Dashboard" asp-
action="Common">Common Dashboard</a>
                        </li>
                    }
                </ul>
                <ul class="navbar-nav ms-auto">
                    @if (User.Identity != null && User.Identity.IsAuthenticated)
                    {
                        <li class="nav-item">
                            <span class="nav-link">Hello,
@User.Identity.Name!</span>
                        </li>
                        <li class="nav-item">
                            <form class="d-inline" asp-controller="Account" asp-
action="Logout" method="post">
                                <button type="submit" class="btn btn-link nav-link"
style="display:inline; padding:0;">Logout</button>
                            </form>
                        </li>
                    }
                    else
                    {
                        <li class="nav-item">
                            <a class="nav-link" asp-controller="Account" asp-
action="Login">Login</a>
                        </li>
                        <li class="nav-item">
                            <a class="nav-link" asp-controller="Account" asp-
action="Register">Register</a>
                        </li>
                    }
                </ul>
            </div>
            </div>
        </nav>
    </header>
    <div class="container">
        <main role="main" class="pb-3">
            @RenderBody()
        </main>
    </div>
    <script src="~/lib/jquery/dist/jquery.min.js"></script>
    <script src="~/lib/bootstrap/dist/js/bootstrap.bundle.min.js"></script>
    <script src="~/js/site.js" asp-append-version="true"></script>
    @await RenderSectionAsync("Scripts", required: false)
<hr />
<h2>Created by: Arjun Mijar (79010160)</h2>
</body>
</html>
```

Views/Home/Index.cshtml

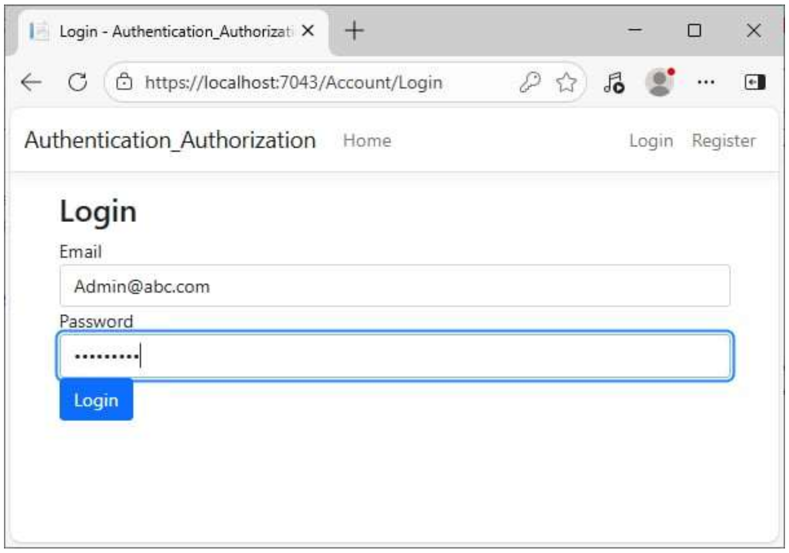
```
@{
    ViewData["Title"] = "Welcome Page";
}
<div class="text-center">
    <h1 class="display-4">Welcome to ASCOL</h1>
</div>
```

Output:



Welcome

Created by: Arjun Mijar (79010160)


Login - Authentication_Authorizati
https://localhost:7043/Account/Login
Authentication_Authorization
Home
Login
Register

Login

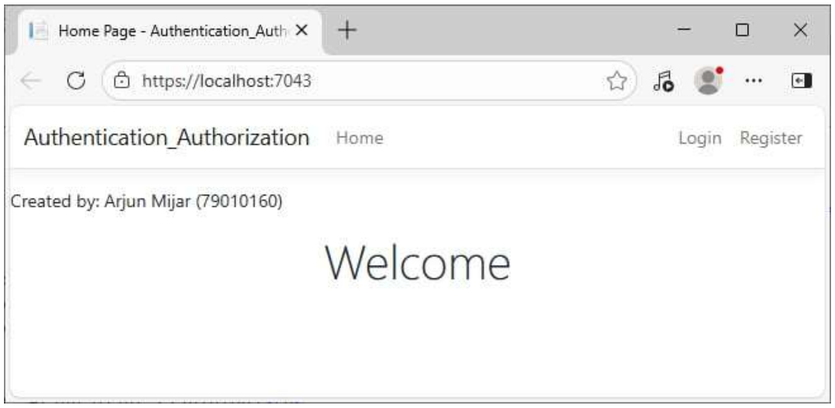
Email

Admin@abc.com

Password

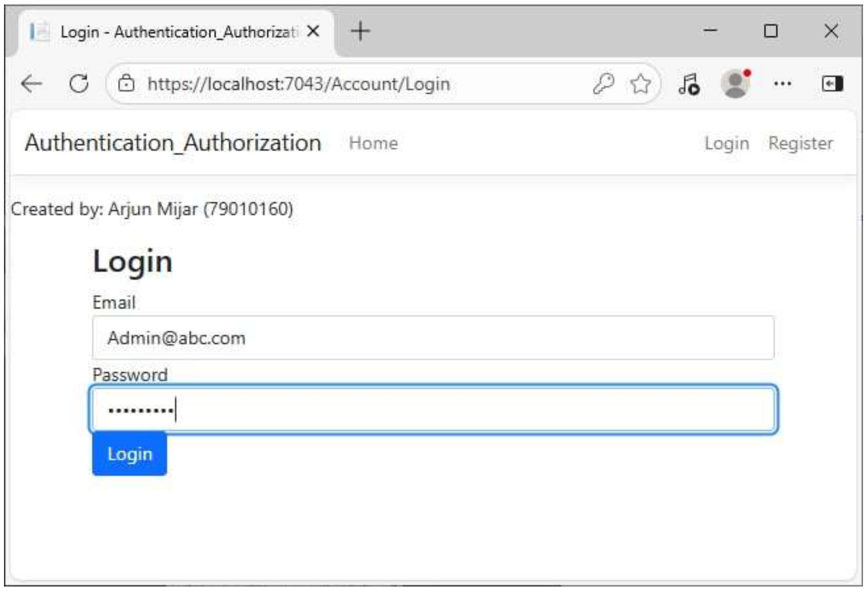
•••••••••

Login



Created by: Arjun Mijar (79010160)

Welcome


Login - Authentication_Authorizati
https://localhost:7043/Account/Login
Authentication_Authorization
Home
Login
Register

Created by: Arjun Mijar (79010160)

Login

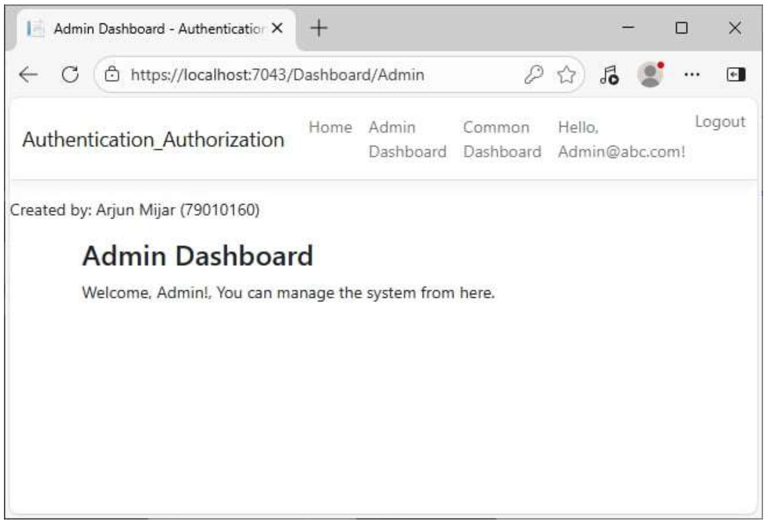
Email

Admin@abc.com

Password

•••••••••

Login


Admin Dashboard - Authenticatior

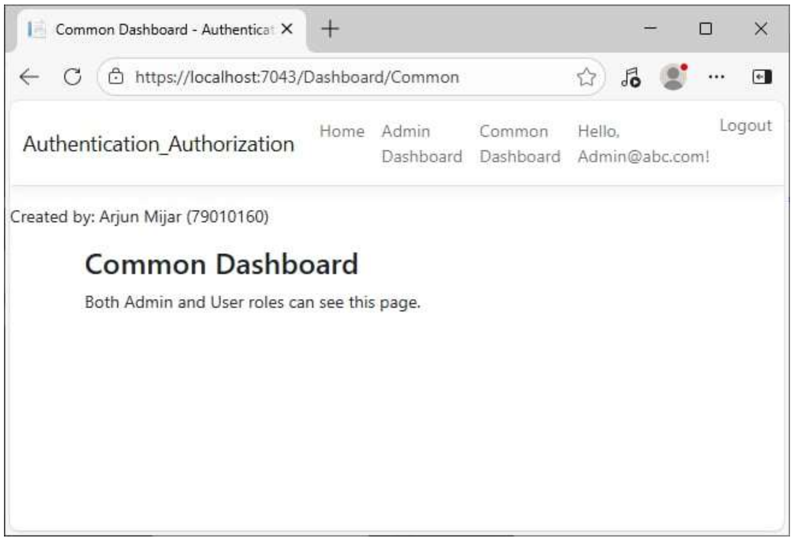
https://localhost:7043/Dashboard/Admin

Authentication_Authorization Home Admin Dashboard Common Dashboard Hello, Admin@abc.com! Logout

Created by: Arjun Mijar (79010160)

Admin Dashboard

Welcome, Admin!, You can manage the system from here.


Common Dashboard - Authenticat

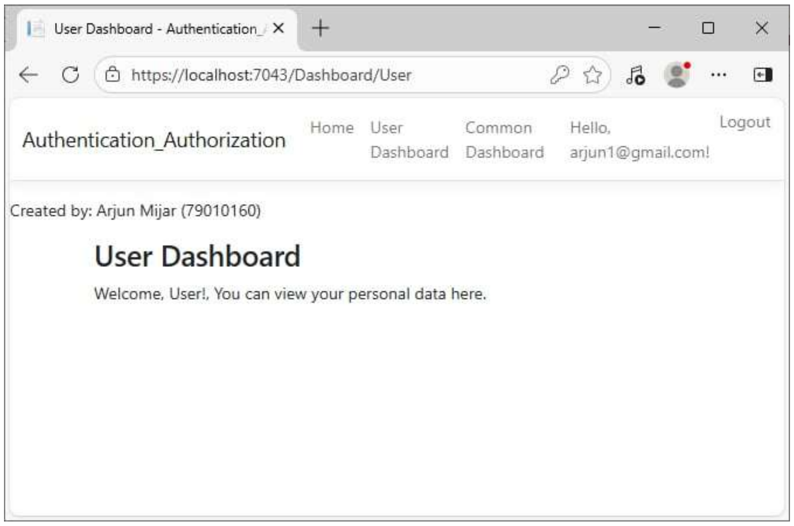
https://localhost:7043/Dashboard/Common

Authentication_Authorization Home Admin Dashboard Common Dashboard Hello, Admin@abc.com! Logout

Created by: Arjun Mijar (79010160)

Common Dashboard

Both Admin and User roles can see this page.


User Dashboard - Authentication_

https://localhost:7043/Dashboard/User

Authentication_Authorization Home User Dashboard Common Dashboard Hello, arjun1@gmail.com! Logout

Created by: Arjun Mijar (79010160)

User Dashboard

Welcome, User!, You can view your personal data here.

9. Define cookie. Write a program to store User login information for 5 days using Cookie.

A **cookie** is a **small piece of data stored by a web browser** on a user's device. It is used to **remember information about the user or their activity** on a website.

Key points:

- Stores user preferences, login sessions, or tracking info.
- Sent between the browser and server with each request.
- Can be **persistent** (saved across sessions) or **session-based** (deleted when browser closes).

Source Code:

Controllers/AccountController.cs

```
using Microsoft.AspNetCore.Mvc;
using Microsoft.AspNetCore.Http;
using System;
namespace MVC_Cookies.Controllers
{
    public class AccountController : Controller
    {
        // GET: Account/Login
        [HttpGet]
        public IActionResult Login()
        {
            return View();
        }
        // POST: Account/Login
        [HttpPost]
        public IActionResult Login(string username, string password)
        {
            // Dummy validation (for example only)
            if (username == "admin" && password == "1234")
            {
                // Create cookie options
                CookieOptions options = new CookieOptions
                {
                    Expires = DateTime.Now.AddDays(5), // Cookie valid for 5 days
                    HttpOnly = true, // Prevents client-side script access
                    Secure = true    // Use HTTPS
                };
                // Store user login info in cookie
                Response.Cookies.Append("UserName", username, options);

                ViewBag.Message = "Login successful! Cookie is stored for 5 days.";
                return View("Welcome");
            }
            else
            {
                ViewBag.Message = "Invalid username or password.";
                return View();
            }
        }
        // GET: Account/Welcome
        public IActionResult Welcome()
        {
            string username = Request.Cookies["UserName"];
            if (username != null)
            {
                ViewBag.User = username;
                return View();
            }
            return RedirectToAction("Login");
        }
        // Logout Action
        public IActionResult Logout()
        {
            Response.Cookies.Delete("UserName");
            return RedirectToAction("Login");
        }
    }
}
```

Views/Account/Login.cshtml

```
@{
    ViewData["Title"] = "Login";
}
<h2>Login Page</h2>
<form method="post" asp-controller="Account" asp-action="Login">
    <label>Username:</label>
    <input type="text" name="username" required /><br /><br />
    <label>Password:</label>
    <input type="password" name="password" required /><br /><br />
    <button type="submit">Login</button>
</form>
<p style="color:red">@ViewBag.Message</p>
```

Views/Account/Welcome.cshtml

```
@{
    ViewData["Title"] = "Welcome";
}
<h2>Welcome, @ViewBag.User!</h2>
<p>Your login information is stored in a cookie for 5 days.</p>
<a asp-controller="Account" asp-action="Logout">Logout</a>
```

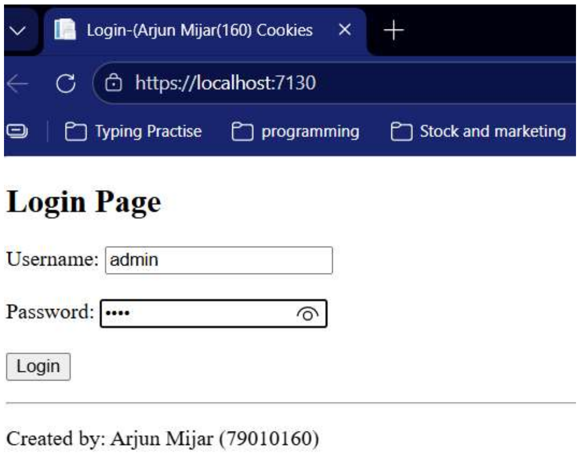
Views/Shared/_Layout.cshtml

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"]-(Arjun Mijar(160) Cookies</title>
</head>
<body>

    <div class="container">
        <main role="main" class="pb-3">
            @RenderBody()
        </main>
    </div>
    <script src="~/lib/jquery/dist/jquery.min.js"></script>
    <script src="~/lib/bootstrap/dist/js/bootstrap.bundle.min.js"></script>
    <script src="~/js/site.js" asp-append-version="true"></script>
    @await RenderSectionAsync("Scripts", required: false)
<hr>
<p> Created by: Arjun Mijar (79010160)</p>
</body>
</html>
```

Program.cs

```
namespace MVC_Cookies
{
    public class Program
    {
        public static void Main(string[] args)
        {
            var builder = WebApplication.CreateBuilder(args);
            // Add services to the container.
            builder.Services.AddControllersWithViews();
            var app = builder.Build();
            // Configure the HTTP request pipeline.
            if (!app.Environment.IsDevelopment())
            {
                app.UseExceptionHandler("/Home/Error");
                app.UseHsts();
            }
            app.UseHttpsRedirection();
            app.UseStaticFiles();
            app.UseRouting();
            app.UseAuthorization();
            app.MapControllerRoute(
                name: "default",
                pattern: "{controller=Account}/{action=Login}/{id?}");
            app.Run();
        }
    }
}
```

Output:



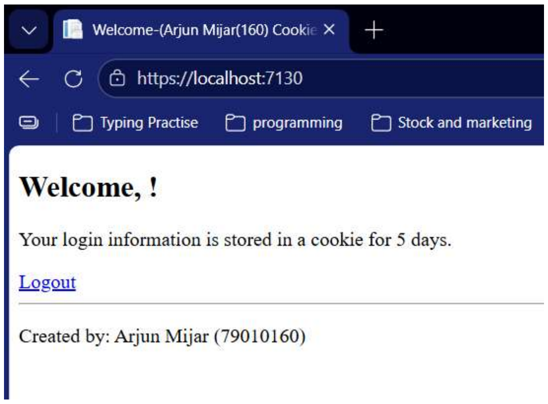
Login Page

Username: admin

Password: ••••

Login

Created by: Arjun Mijar (79010160)

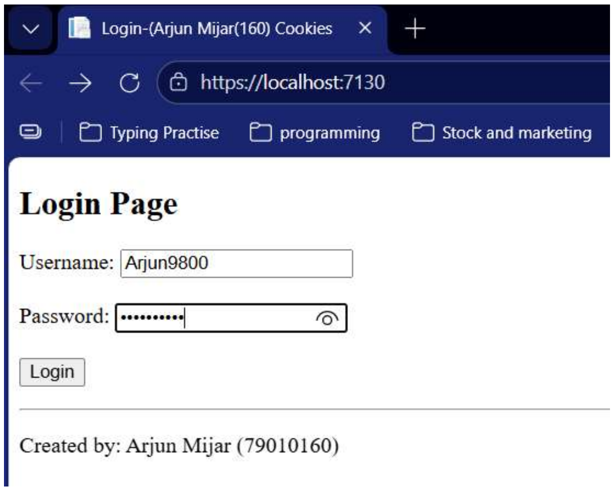


Welcome, !

Your login information is stored in a cookie for 5 days.

Logout

Created by: Arjun Mijar (79010160)



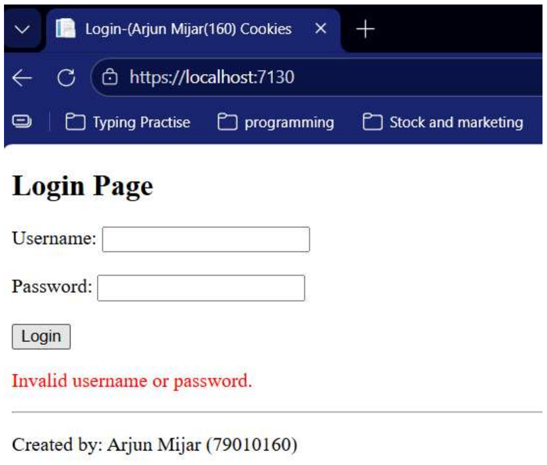
Login Page

Username: Arjun9800

Password: ••••••••••

Login

Created by: Arjun Mijar (79010160)



Login Page

Username:

Password:

Login

Invalid username or password.

Created by: Arjun Mijar (79010160)

10. Define single page application. Write a program to validate the Login form when user submit empty value using JQuery.

A **Single Page Application (SPA)** is a **web application that loads a single HTML page** and **dynamically updates content** as the user interacts with it, without reloading the whole page.

Key points:

- Provides a **smooth, app-like user experience**.
- Uses **AJAX or APIs** to fetch data in the background.
- Examples: Gmail, Google Maps, Facebook.

Source Code:

Controller/AccountController.cs

```
using Microsoft.AspNetCore.Mvc;
using MVC_jQuery.Models;
namespace MVC_jQuery.Controllers
{
    public class AccountController : Controller
    {
        [HttpGet]
        public IActionResult Login()
        {
            return View();
        }
        [HttpPost]
        public IActionResult Login(LoginViewModel model)
        {
            if (!ModelState.IsValid)
            {
                return View(model);
            }
            // Add authentication logic here...
            return RedirectToAction("Index", "Home");
        }
    }
}
```

Models/LoginViewModel.cs

```
using System.ComponentModel.DataAnnotations;
namespace MVC_jQuery.Models
{
    public class LoginViewModel
    {
        [Required(ErrorMessage = "Username is required")]
        public string Username { get; set; }
        [Required(ErrorMessage = "Password is required")]
        public string Password { get; set; }
    }
}
```

Views/Account/Login.cshtml

```
@model MVC_jQuery.Models.LoginViewModel
@{
    ViewData["Title"] = "Login";
}
<h2>Login</h2>
<form id="loginForm" asp-action="Login" asp-controller="Account" method="post">
    <div>
        <label>Username:</label>
        <input type="text" id="Username" name="Username" />
    </div>
    <div>
        <label>Password:</label>
        <input type="password" id="Password" name="Password" />
    </div>
    <div>
        <input type="submit" value="Login" />
    </div>
</form>
<!-- Validation Message Display -->
<div id="errorMessages" style="color:red; margin-top:10px;"></div>
@section Scripts {
    <script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
    <script>
        $(document).ready(function () {
            $("#loginForm").submit(function (e) {
                var username = $("#Username").val().trim();
                var password = $("#Password").val().trim();
                var errorMsg = "";
                if (username === "" || password === "") {
                    e.preventDefault(); // Stop form submission

                    if (username === "") {
                        errorMsg += "Username is required.<br/>";
                    }
                    if (password === "") {
                        errorMsg += "Password is required.<br/>";
                    }
                    $("#errorMessages").html(errorMsg);
                }
            });
        });
    </script>
}
```

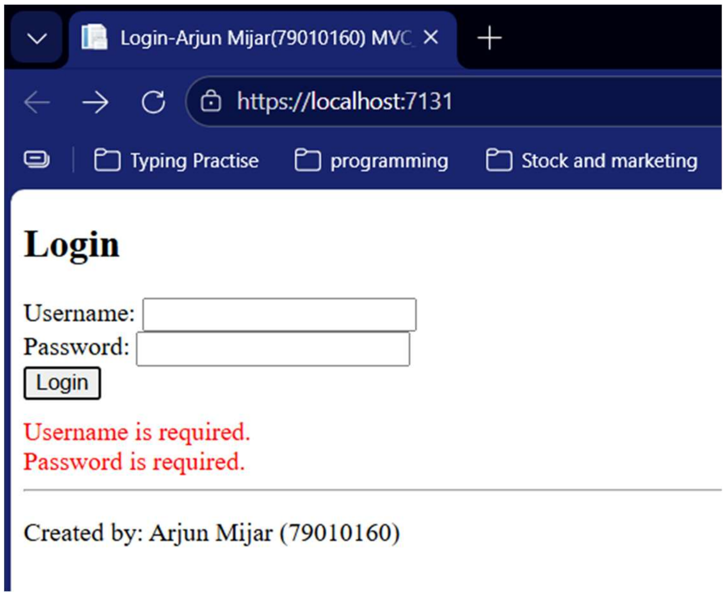
views/shared/_layaout.cshtml

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"]-Arjun Mijar(79010160) MVC_jQuery</title>
</head>
<body>
    <div class="container">
        <main role="main" class="pb-3">
            @RenderBody()
        </main>
    </div>
    <script src="~/lib/jquery/dist/jquery.min.js"></script>
    <script src="~/lib/bootstrap/dist/js/bootstrap.bundle.min.js"></script>
    <script src="~/js/site.js" asp-append-version="true"></script>
    @await RenderSectionAsync("Scripts", required: false)
    <hr />
    <p>Created by: Arjun Mijar (79010160)</p>
</body>
</html>
```

Program.cs

```
namespace MVC_jQuery
{
    public class Program
    {
        public static void Main(string[] args)
        {
            var builder = WebApplication.CreateBuilder(args);
            // Add services to the container.
            builder.Services.AddControllersWithViews();
            var app = builder.Build();
            // Configure the HTTP request pipeline.
            if (!app.Environment.IsDevelopment())
            {
                app.UseExceptionHandler("/Home/Error");
                app.UseHsts();
            }
            app.UseHttpsRedirection();
            app.UseStaticFiles();
            app.UseRouting();
            app.UseAuthorization();
            app.MapControllerRoute(
                name: "default",
                pattern: "{controller=Account}/{action=Login}/{id?}");
            app.Run();
        }
    }
}
```

Output:


Login-Arjun Mijar(79010160) MVC

https://localhost:7131

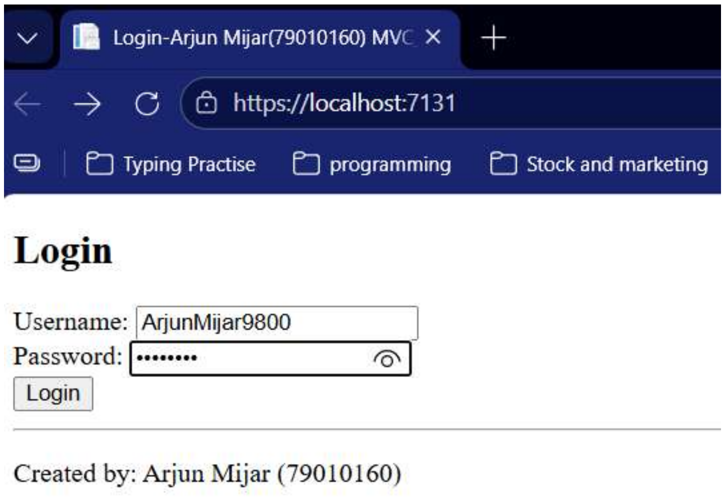
Typing Practise programming Stock and marketing

Login

Username:
Password:
Login

Username is required.
Password is required.

Created by: Arjun Mijar (79010160)


Login-Arjun Mijar(79010160) MVC

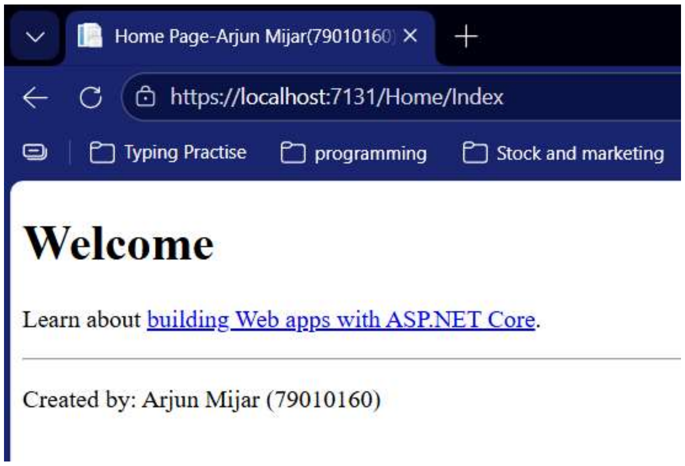
https://localhost:7131

Typing Practise programming Stock and marketing

Login

Username: ArjunMijar9800
Password: ••••••••
Login

Created by: Arjun Mijar (79010160)


Home Page-Arjun Mijar(79010160)

https://localhost:7131/Home/Index

Typing Practise programming Stock and marketing

Welcome

Learn about building Web apps with ASP.NET Core.

Created by: Arjun Mijar (79010160)

11. Define Web API. Write a program to get the list of products in json format using ASP.NET Web API.

A **Web API** (Application Programming Interface) is a **set of rules and protocols** that allows different software applications to **communicate over the web**.

Key points:

- Enables **data exchange** between client and server.
- Can use **HTTP methods** like GET, POST, PUT, DELETE.
- Often returns data in **JSON or XML** format.

Source Code:

Models/Product.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
namespace WebAPI_Example.Models
{
    public class Product
    {
        public int Id { get; set; }
        public string Name { get; set; }
        public double Price { get; set; }
    }
}
```

Controller/ProductsController.cs

```
using System;
using System.Collections.Generic;
using System.Web.Http;
using WebAPI_Example.Models;
namespace WebAPI_Example.Controllers
{
    public class ProductsController : ApiController
    {
        public IEnumerable<Product> Get()
        {
            var products = new List<Product>
            {
                new Product { Id = 1, Name = "Laptop", Price = 55000 },
                new Product { Id = 2, Name = "Smartphone", Price = 25000 },
                new Product { Id = 3, Name = "Headphones", Price = 3000 }
            };
            return products;
        }
    }
}
```

App_Start/WebApiConfig.cs

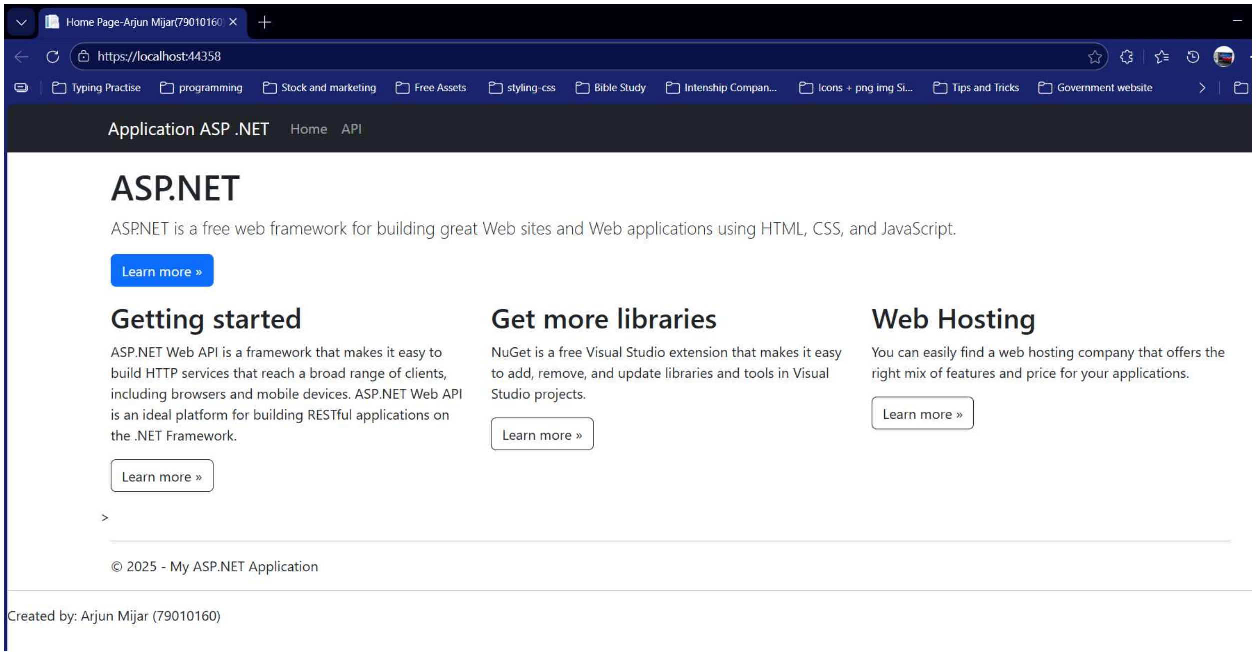
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web.Http;
namespace WebAPI_Example
{
    public static class WebApiConfig
    {
        public static void Register(HttpConfiguration config)
        {
            // Web API configuration and services
            // Web API routes
            config.MapHttpAttributeRoutes();
            config.Routes.MapHttpRoute(
                name: "DefaultApi",
                routeTemplate: "api/{controller}/{id}",
                defaults: new { id = RouteParameter.Optional }
            );
            // Removing XML Formatter to force JSON
            config.Formatters.Remove(config.Formatters.XmlFormatter);
            // Returning JSON Formatter
            config.Formatters.JsonFormatter.SerializerSettings.Formatting =
Newtonsoft.Json.Formatting.Indented;
        }
    }
}
```

views/shared/_layout.cshtml

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title>@ViewBag.Title-Arjun Mijar(79010160) Asp.net Application</title>
    @Styles.Render("~/Content/css")
    @Scripts.Render("~/bundles/modernizr")
</head>
<body>
```

```
    <nav class="navbar navbar-expand-sm navbar-toggleable-sm navbar-dark bg-dark">
        <div class="container">
            @Html.ActionLink("Application ASP .NET", "Index", "Home", new { area =
"" }, new { @class = "navbar-brand" })
            <button type="button" class="navbar-toggler" data-bs-toggle="collapse"
data-bs-target=".navbar-collapse" title="Toggle navigation" aria-
controls="navbarSupportedContent"
                    aria-expanded="false" aria-label="Toggle navigation">
                <span class="navbar-toggler-icon"></span>
            </button>
            <div class="collapse navbar-collapse d-sm-inline-flex justify-content-
between">
                <ul class="navbar-nav flex-grow-1">
                    <li>@Html.ActionLink("Home", "Index", "Home", new { area = "" },
new { @class = "nav-link" })</li>
                    <li>@Html.ActionLink("API", "Index", "Help", new { area = "" },
new { @class = "nav-link" })</li>
                </ul>
            </div>
        </div>
    </nav>
    <div class="container body-content">
        @RenderBody()
        <hr />
        <footer>
            <p>&copy; @DateTime.Now.Year - My ASP.NET Application</p>
        </footer>
    </div>

    @Scripts.Render("~/bundles/jquery")
    @Scripts.Render("~/bundles/bootstrap")
    @RenderSection("scripts", required: false)

    <hr />
    <p>Created by: Arjun Mijar (79010160)</p>
</body>
</html>
```

Output:


Home Page-Arjun Mijar(79010160)

https://localhost:44358

Typing Practise | programming | Stock and marketing | Free Assets | styling-css | Bible Study | Intenship Compan... | Icons + png img Si... | Tips and Tricks | Government website

Application ASP .NET   Home   API

ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS, and JavaScript.

Learn more »

Getting started

ASP.NET Web API is a framework that makes it easy to build HTTP services that reach a broad range of clients, including browsers and mobile devices. ASP.NET Web API is an ideal platform for building RESTful applications on the .NET Framework.

Learn more »

Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

Learn more »

Web Hosting

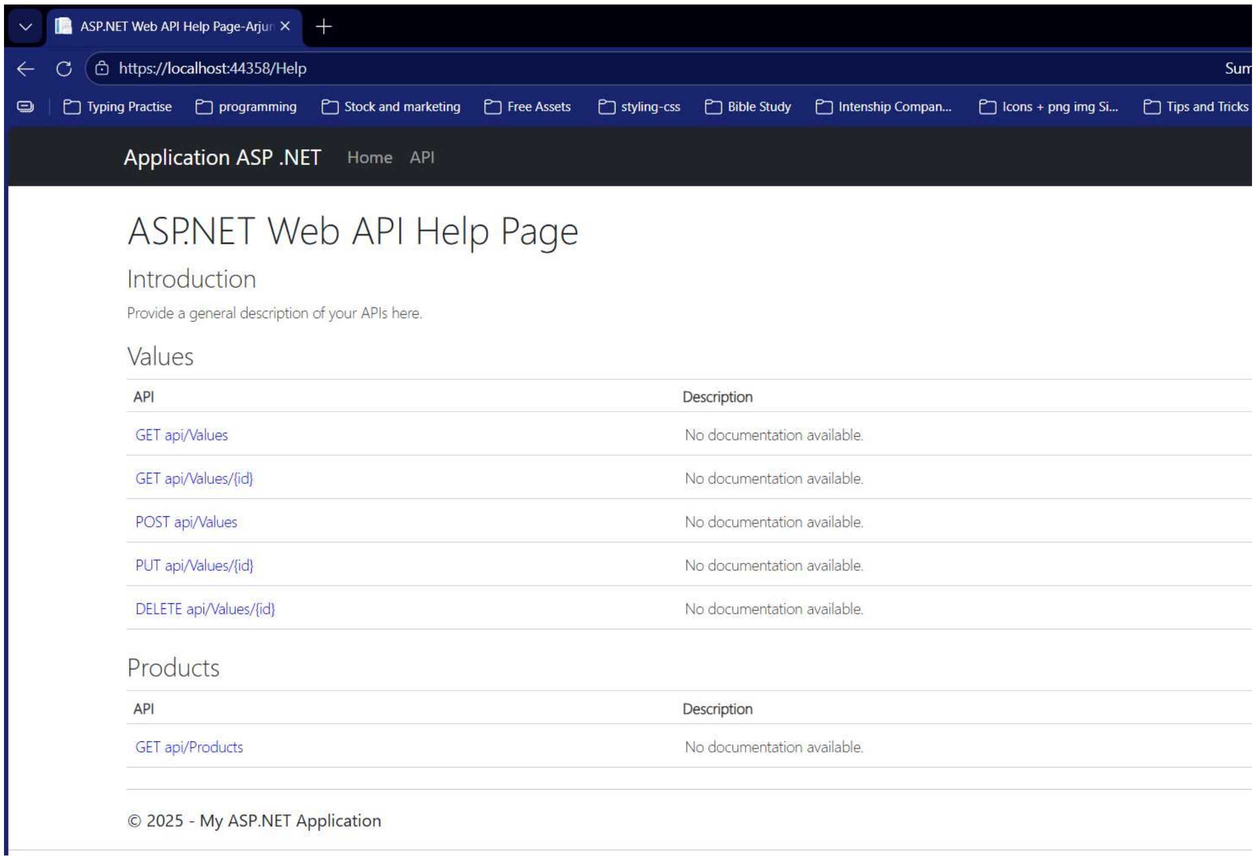
You can easily find a web hosting company that offers the right mix of features and price for your applications.

Learn more »

>

© 2025 - My ASP.NET Application

Created by: Arjun Mijar (79010160)


ASP.NET Web API Help Page-Arjun

https://localhost:44358/Help

Typing Practise | programming | Stock and marketing | Free Assets | styling-css | Bible Study | Intenship Compan... | Icons + png img Si... | Tips and Tricks

Application ASP .NET   Home   API

ASP.NET Web API Help Page

Introduction

Provide a general description of your APIs here.

Values

API	Description
GET api/Values	No documentation available.
GET api/Values/{id}	No documentation available.
POST api/Values	No documentation available.
PUT api/Values/{id}	No documentation available.
DELETE api/Values/{id}	No documentation available.

Products

API	Description
GET api/Products	No documentation available.

© 2025 - My ASP.NET Application