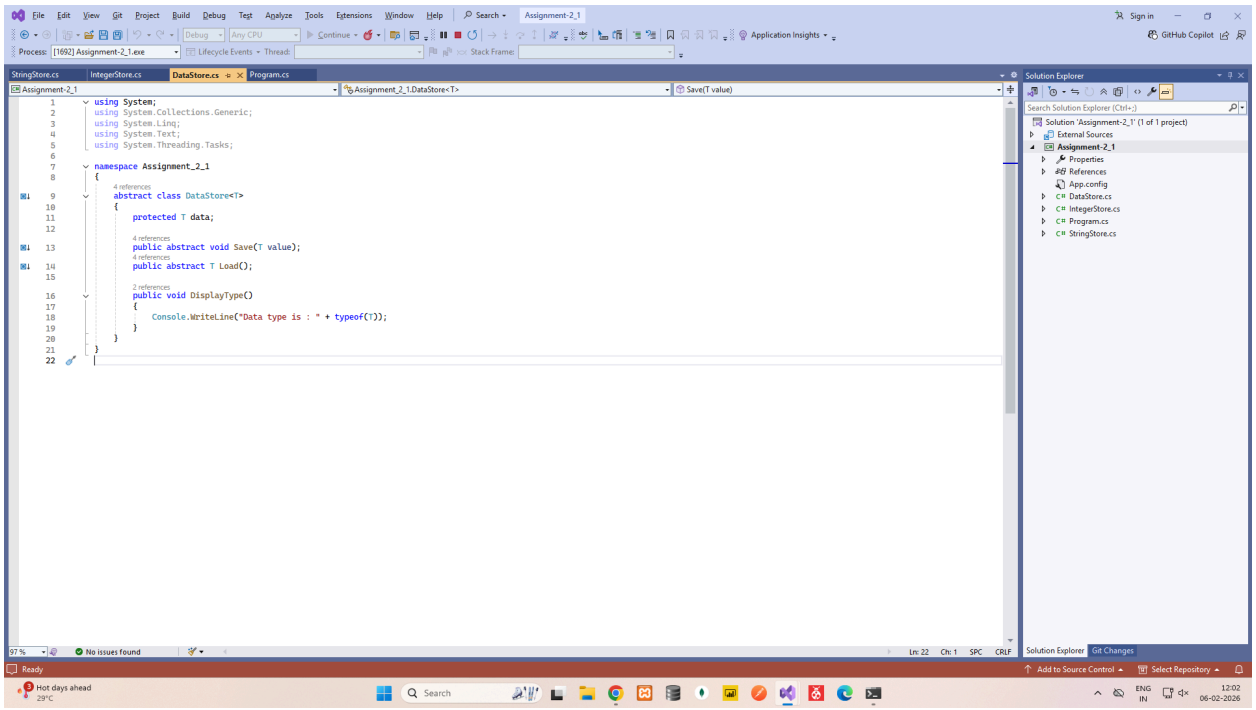
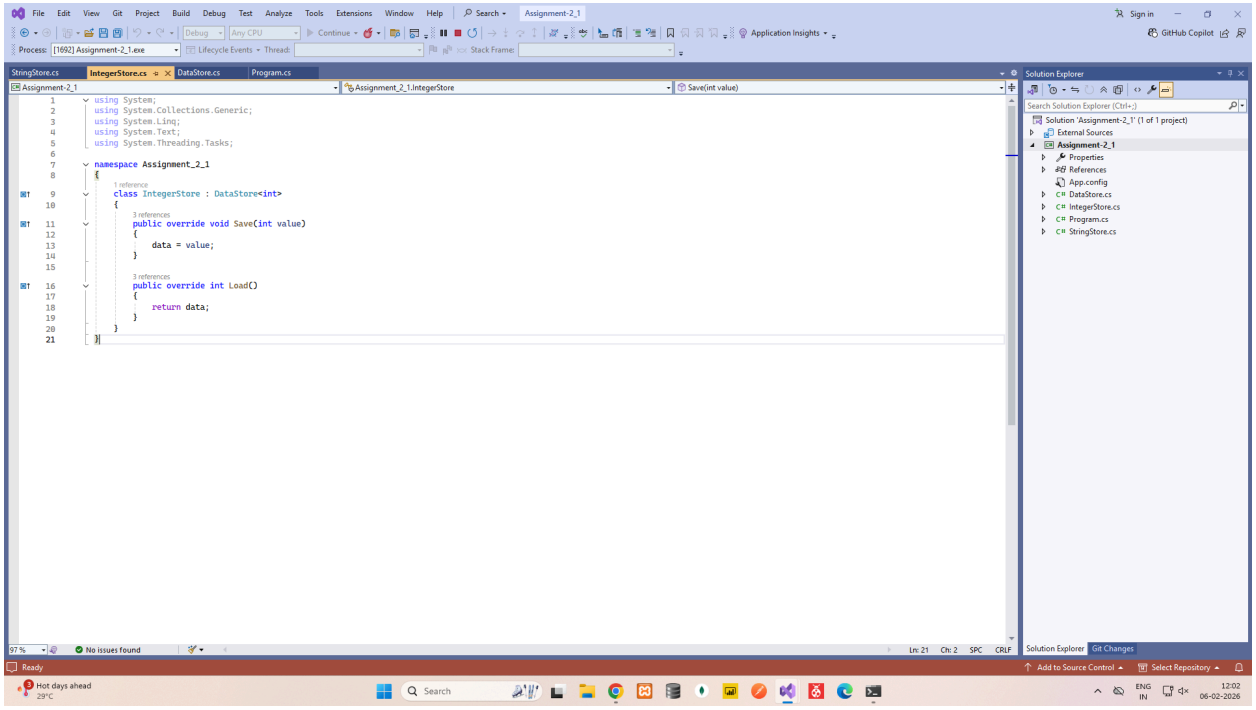
Assignment - 2

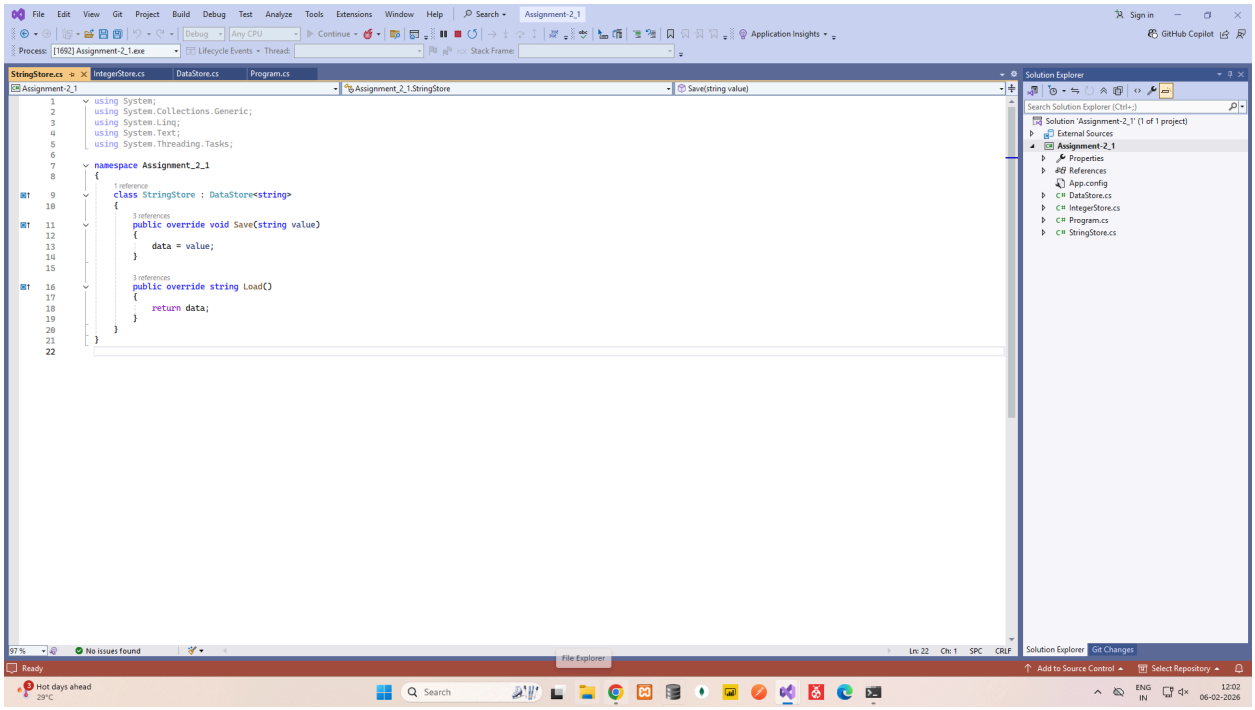
1) Create a C# application to demonstrate use of Generic Abstract class.

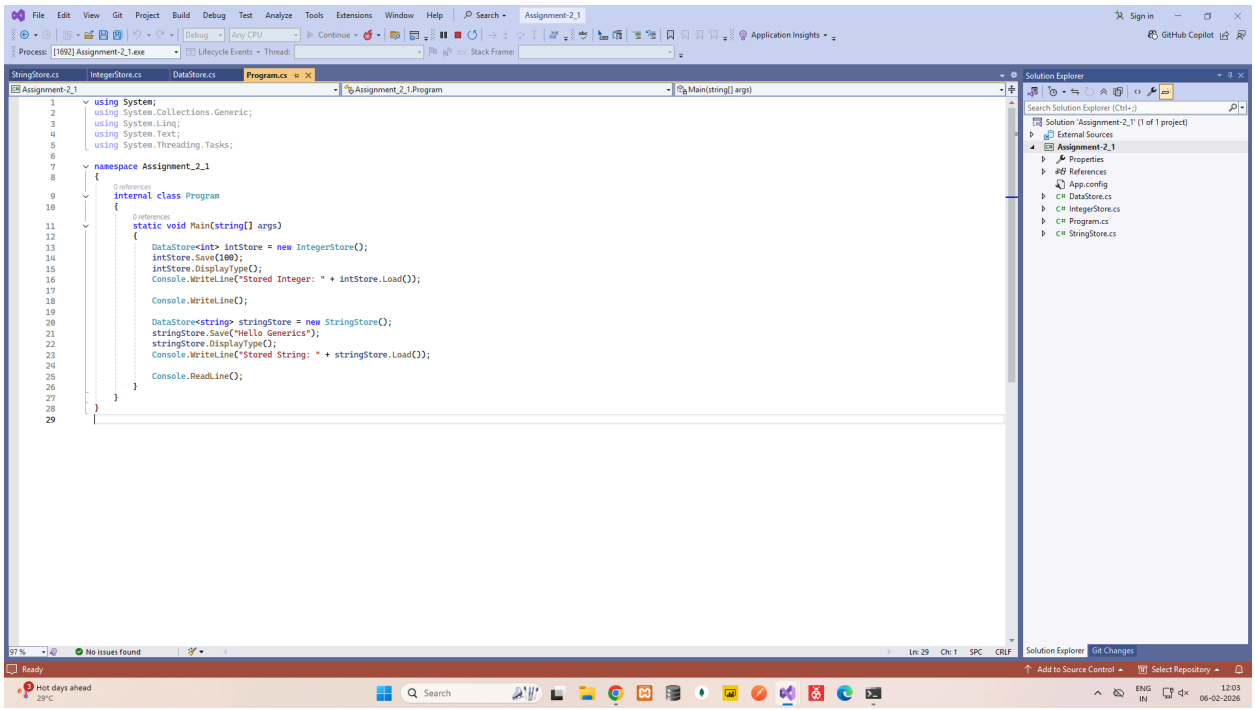


```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Assignment_2_1
{
    4 references
    abstract class DataStore<T>
    {
        protected T data;

        4 references
        public abstract void Save(T value);
        4 references
        public abstract T Load();

        2 references
        public void DisplayType()
        {
            Console.WriteLine("Data type is : " + typeof(T));
        }
    }
}
```



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

namespace Assignment_2_1
{
    1 reference
    class IntegerStore : DataStore<int>
    {
        3 references
        public override void Save(int value)
        {
            data = value;
        }

        3 references
        public override int Load()
        {
            return data;
        }
    }
}
```


StringStore.cs
IntegerStore.cs
DataStore.cs
Program.cs
Assignment-2_1
Assignment_2_1.StringStore
Save(string value)
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace Assignment_2_1
{
1 reference
class StringStore : DataStore<string>
{
3 references
public override void Save(string value)
{
data = value;
}
3 references
public override string Load()
{
return data;
}
}
}
Solution Explorer
Solution 'Assignment-2_1' (1 of 1 project)
External Sources
Assignment-2_1
Properties
References
App.config
DataStore.cs
IntegerStore.cs
Program.cs
StringStore.cs
No issues found
Ln: 22 Ch: 1 SPC CRLF
Ready
Add to Source Control
Select Repository


StringStore.cs
IntegerStore.cs
DataStore.cs
Program.cs
Assignment-2_1
Assignment_2_1.Program
Main(string[] args)
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace Assignment_2_1
{
0 references
internal class Program
{
0 references
static void Main(string[] args)
{
DataStore<int> intStore = new IntegerStore();
intStore.Save(100);
intStore.DisplayType();
Console.WriteLine("Stored Integer: " + intStore.Load());
Console.WriteLine();
DataStore<string> stringStore = new StringStore();
stringStore.Save("Hello Generics");
stringStore.DisplayType();
Console.WriteLine("Stored String: " + stringStore.Load());
Console.ReadLine();
}
}
}
Solution Explorer
Solution 'Assignment-2_1' (1 of 1 project)
External Sources
Assignment-2_1
Properties
References
App.config
DataStore.cs
IntegerStore.cs
Program.cs
StringStore.cs
No issues found
Ln: 29 Ch: 1 SPC CRLF
Ready
Add to Source Control
Select Repository

DataStore.cs

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

namespace Assignment_2_1
{
    abstract class DataStore<T>
    {
        protected T data;

        public abstract void Save(T value);
        public abstract T Load();

        public void DisplayType()
        {
            Console.WriteLine("Data type is : " + typeof(T));
        }
    }
}
```

IntegerStore.cs

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

namespace Assignment_2_1
{
    class IntegerStore : DataStore<int>
    {
        public override void Save(int value)
        {
            data = value;
        }
```

```
        public override int Load()
        {
            return data;
        }
    }
}
```

StringStore.cs

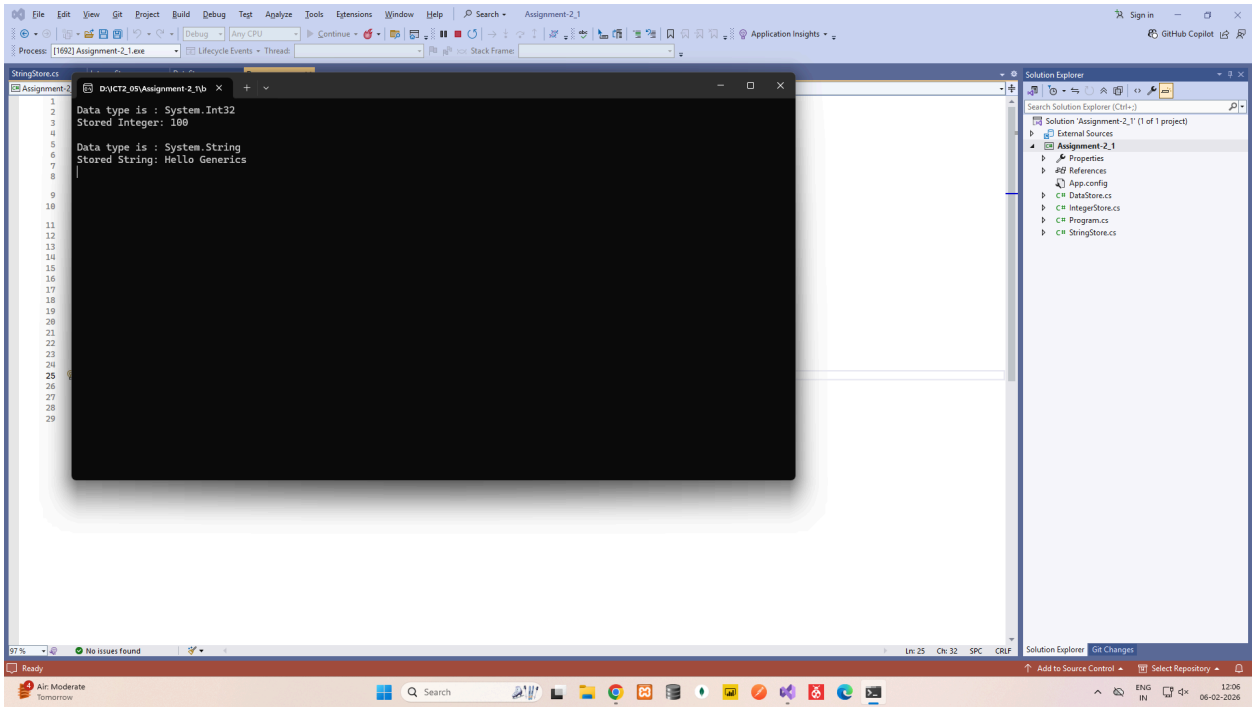
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Assignment_2_1
{
    class StringStore : DataStore<string>
    {
        public override void Save(string value)
        {
            data = value;
        }

        public override string Load()
        {
            return data;
        }
    }
}
```

Program.cs

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

namespace Assignment_2_1
```

```
{
    internal class Program
    {
        static void Main(string[] args)
        {
            DataStore<int> intStore = new IntegerStore();
            intStore.Save(100);
            intStore.DisplayType();
            Console.WriteLine("Stored Integer: " + intStore.Load());

            Console.WriteLine();

            DataStore<string> stringStore = new StringStore();
            stringStore.Save("Hello Generics");
            stringStore.DisplayType();
            Console.WriteLine("Stored String: " + stringStore.Load());

            Console.ReadLine();
        }
    }
}
```

Output :



2) Create an MVC Core web application to perform CRUD operations for Project allocation to employees using EntityFramework. Also create advance search functionality to search employee on project.

Models/Employee.cs

```
using System;
using System.Collections.Generic;

namespace Assignment_2_2.Models;

public partial class Employee
{
    public int EmployeeId { get; set; }

    public string? EmployeeName { get; set; }

    public string? Email { get; set; }

    public string? Department { get; set; }

    public DateOnly? JoiningDate { get; set; }

    public bool? IsActive { get; set; }

    public virtual ICollection<ProjectAllocation> ProjectAllocations { get; set; } = new
List<ProjectAllocation>();
}
```

Models/Project.cs

```
using System;
using System.Collections.Generic;

namespace Assignment_2_2.Models;

public partial class Project
{
    public int ProjectId { get; set; }
```

```
    public string? ProjectName { get; set; }

    public string? Description { get; set; }

    public DateOnly? StartDate { get; set; }

    public DateOnly? EndDate { get; set; }

    public string? Status { get; set; }

    public virtual ICollection<ProjectAllocation> ProjectAllocations { get; set; } = new
List<ProjectAllocation>();
}
```

Models/ProjectAllocation.cs

```
using Microsoft.AspNetCore.Mvc.ModelBinding.Validation;
using System;
using System.Collections.Generic;

namespace Assignment_2_2.Models;

public partial class ProjectAllocation
{
    public int AllocationId { get; set; }

    public int EmployeeId { get; set; }

    public int ProjectId { get; set; }

    public DateOnly? AllocationDate { get; set; }

    public string? Role { get; set; }

    public bool? IsActive { get; set; }

    [ValidateNever]
    public virtual Employee Employee { get; set; } = null!;

    [ValidateNever]
    public virtual Project Project { get; set; } = null!;
}
```

Controllers/EmployeeController.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Threading.Tasks;
using Microsoft.AspNetCore.Mvc;
using Microsoft.AspNetCore.Mvc.Rendering;
using Microsoft.EntityFrameworkCore;
using Assignment_2_2.Models;

namespace Assignment_2_2.Controllers
{
    public class EmployeesController : Controller
    {
        private readonly Ict2projectAllocationDbContext _context;

        public EmployeesController(Ict2projectAllocationDbContext context)
        {
            _context = context;
        }

        // GET: Employees
        public async Task<IActionResult> Index()
        {
            return View(await _context.Employees.ToListAsync());
        }

        // GET: Employees/Details/5
        public async Task<IActionResult> Details(int? id)
        {
            if (id == null)
            {
                return NotFound();
            }

            var employee = await _context.Employees
                .FirstOrDefaultAsync(m => m.EmployeeId == id);
            if (employee == null)
            {
                return NotFound();
```

```
            }

            return View(employee);
        }

        // GET: Employees/Create
        public IActionResult Create()
        {
            return View();
        }

        // POST: Employees/Create
        // To protect from overposting attacks, enable the specific properties you want to bind to.
        // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<IActionResult>
Create([Bind("EmployeeId,EmployeeName,Email,Department,JoiningDate,IsActive")] Employee
employee)
        {
            if (ModelState.IsValid)
            {
                employee.IsActive = true;
                _context.Add(employee);
                await _context.SaveChangesAsync();
                return RedirectToAction(nameof(Index));
            }
            return View(employee);
        }

        // GET: Employees/Edit/5
        public async Task<IActionResult> Edit(int? id)
        {
            if (id == null)
            {
                return NotFound();
            }

            var employee = await _context.Employees.FindAsync(id);
            if (employee == null)
            {
                return NotFound();
```

```
            }
            return View(employee);
        }

        // POST: Employees/Edit/5
        // To protect from overposting attacks, enable the specific properties you want to bind to.
        // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<IActionResult> Edit(int id,
[Bind("EmployeeId,EmployeeName,Email,Department,JoiningDate,IsActive")] Employee
employee)
        {
            if (id != employee.EmployeeId)
            {
                return NotFound();
            }

            if (ModelState.IsValid)
            {
                try
                {
                    _context.Update(employee);
                    await _context.SaveChangesAsync();
                }
                catch (DbUpdateConcurrencyException)
                {
                    if (!EmployeeExists(employee.EmployeeId))
                    {
                        return NotFound();
                    }
                    else
                    {
                        throw;
                    }
                }
                return RedirectToAction(nameof(Index));
            }
            return View(employee);
        }

        // GET: Employees/Delete/5
```

```
public async Task<IActionResult> Delete(int? id)
{
    if (id == null)
    {
        return NotFound();
    }

    var employee = await _context.Employees
        .FirstOrDefaultAsync(m => m.EmployeeId == id);
    if (employee == null)
    {
        return NotFound();
    }

    return View(employee);
}

// POST: Employees/Delete/5
[HttpPost, ActionName("Delete")]
[ValidateAntiForgeryToken]
public async Task<IActionResult> DeleteConfirmed(int id)
{
    var employee = await _context.Employees.FindAsync(id);
    if (employee != null)
    {
        _context.Employees.Remove(employee);
    }

    await _context.SaveChangesAsync();
    return RedirectToAction(nameof(Index));
}

private bool EmployeeExists(int id)
{
    return _context.Employees.Any(e => e.EmployeeId == id);
}

public IActionResult SearchByProjectName()
{
    return View();
}
```

```
        [HttpPost]
        public IActionResult SearchByProjectName(string projectName)
        {
            var employees = _context.Employees
            .Include(e => e.ProjectAllocations)
                .ThenInclude(pa => pa.Project)
            .Where(e => e.ProjectAllocations.Any(pa =>
pa.Project.ProjectName.Contains(projectName)))
            .ToList();

            return View("SearchResult", employees);
        }

        public IActionResult SearchResult(List<Employee> employeeList)
        {
            return View(employeeList);
        }
    }
}
```

Controllers/ProjectsController.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Threading.Tasks;
using Microsoft.AspNetCore.Mvc;
using Microsoft.AspNetCore.Mvc.Rendering;
using Microsoft.EntityFrameworkCore;
using Assignment_2_2.Models;

namespace Assignment_2_2.Controllers
{
    public class ProjectsController : Controller
    {
        private readonly Ict2projectAllocationDbContext _context;

        public ProjectsController(Ict2projectAllocationDbContext context)
        {
```

```
        _context = context;
    }

    // GET: Projects
    public async Task<IActionResult> Index()
    {
        return View(await _context.Projects.ToListAsync());
    }

    // GET: Projects/Details/5
    public async Task<IActionResult> Details(int? id)
    {
        if (id == null)
        {
            return NotFound();
        }

        var project = await _context.Projects
            .FirstOrDefaultAsync(m => m.ProjectId == id);
        if (project == null)
        {
            return NotFound();
        }

        return View(project);
    }

    // GET: Projects/Create
    public IActionResult Create()
    {
        return View();
    }

    // POST: Projects/Create
    // To protect from overposting attacks, enable the specific properties you want to bind to.
    // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
    [HttpPost]
    [ValidateAntiForgeryToken]
```

```
        public async Task<IActionResult>
Create([Bind("ProjectId,ProjectName,Description,StartDate,EndDate,Status")] Project
project)
        {
            if (ModelState.IsValid)
            {
                _context.Add(project);
                await _context.SaveChangesAsync();
                return RedirectToAction(nameof(Index));
            }
            return View(project);
        }

        // GET: Projects/Edit/5
        public async Task<IActionResult> Edit(int? id)
        {
            if (id == null)
            {
                return NotFound();
            }

            var project = await _context.Projects.FindAsync(id);
            if (project == null)
            {
                return NotFound();
            }
            return View(project);
        }

        // POST: Projects/Edit/5
        // To protect from overposting attacks, enable the specific properties you want to
bind to.
        // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<IActionResult> Edit(int id,
[Bind("ProjectId,ProjectName,Description,StartDate,EndDate,Status")] Project project)
        {
            if (id != project.ProjectId)
```

```
    {
        return NotFound();
    }

    if (ModelState.IsValid)
    {
        try
        {
            _context.Update(project);
            await _context.SaveChangesAsync();
        }
        catch (DbUpdateConcurrencyException)
        {
            if (!ProjectExists(project.ProjectId))
            {
                return NotFound();
            }
            else
            {
                throw;
            }
        }
        return RedirectToAction(nameof(Index));
    }
    return View(project);
}

// GET: Projects/Delete/5
public async Task<IActionResult> Delete(int? id)
{
    if (id == null)
    {
        return NotFound();
    }

    var project = await _context.Projects
        .FirstOrDefaultAsync(m => m.ProjectId == id);
    if (project == null)
    {
```

```
            return NotFound();
        }

        return View(project);
    }

    // POST: Projects/Delete/5
    [HttpPost, ActionName("Delete")]
    [ValidateAntiForgeryToken]
    public async Task<IActionResult> DeleteConfirmed(int id)
    {
        var project = await _context.Projects.FindAsync(id);
        if (project != null)
        {
            _context.Projects.Remove(project);
        }

        await _context.SaveChangesAsync();
        return RedirectToAction(nameof(Index));
    }

    private bool ProjectExists(int id)
    {
        return _context.Projects.Any(e => e.ProjectId == id);
    }
  }
}
```

Controllers/ProjectAllocations.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Threading.Tasks;
using Microsoft.AspNetCore.Mvc;
using Microsoft.AspNetCore.Mvc.Rendering;
using Microsoft.EntityFrameworkCore;
using Assignment_2_2.Models;
```

```
namespace Assignment_2_2.Controllers
{
    public class ProjectAllocationsController : Controller
    {
        private readonly Ict2projectAllocationDbContext _context;

        public ProjectAllocationsController(Ict2projectAllocationDbContext context)
        {
            _context = context;
        }

        // GET: ProjectAllocations
        public async Task<IActionResult> Index()
        {
            var ict2projectAllocationDbContext = _context.ProjectAllocations.Include(p =>
p.Employee).Include(p => p.Project);
            return View(await ict2projectAllocationDbContext.ToListAsync());
        }

        // GET: ProjectAllocations/Details/5
        public async Task<IActionResult> Details(int? id)
        {
            if (id == null)
            {
                return NotFound();
            }

            var projectAllocation = await _context.ProjectAllocations
                .Include(p => p.Employee)
                .Include(p => p.Project)
                .FirstOrDefaultAsync(m => m.AllocationId == id);
            if (projectAllocation == null)
            {
                return NotFound();
            }

            return View(projectAllocation);
        }
```

```
        // GET: ProjectAllocations/Create
        public IActionResult Create()
        {
            ViewData["EmployeeId"] = new SelectList(_context.Employees, "EmployeeId",
"EmployeeName");
            ViewData["ProjectId"] = new SelectList(_context.Projects, "ProjectId",
"ProjectName");
            return View();
        }

        // POST: ProjectAllocations/Create
        // To protect from overposting attacks, enable the specific properties you want to
bind to.
        // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<IActionResult>
Create([Bind("AllocationId,EmployeeId,ProjectId,AllocationDate,Role,IsActive")]
ProjectAllocation projectAllocation)
        {
            if (ModelState.IsValid)
            {
                projectAllocation.IsActive = true;
                _context.Add(projectAllocation);
                await _context.SaveChangesAsync();
                return RedirectToAction(nameof(Index));
            }
            ViewData["EmployeeId"] = new SelectList(_context.Employees, "EmployeeId",
"EmployeeName", projectAllocation.EmployeeId);
            ViewData["ProjectId"] = new SelectList(_context.Projects, "ProjectId",
"ProjectName", projectAllocation.ProjectId);
            return View(projectAllocation);
        }

        // GET: ProjectAllocations/Edit/5
        public async Task<IActionResult> Edit(int? id)
        {
            if (id == null)
            {
```

```
            return NotFound();
        }

        var projectAllocation = await _context.ProjectAllocations.FindAsync(id);
        if (projectAllocation == null)
        {
            return NotFound();
        }
        ViewData["EmployeeId"] = new SelectList(_context.Employees, "EmployeeId",
"EmployeeName", projectAllocation.EmployeeId);
        ViewData["ProjectId"] = new SelectList(_context.Projects, "ProjectId",
"ProjectName", projectAllocation.ProjectId);
        return View(projectAllocation);
    }

    // POST: ProjectAllocations/Edit/5
    // To protect from overposting attacks, enable the specific properties you want to
bind to.
    // For more details, see http://go.microsoft.com/fwlink/?LinkId=317598.
    [HttpPost]
    [ValidateAntiForgeryToken]
    public async Task<IActionResult> Edit(int id,
[Bind("AllocationId,EmployeeId,ProjectId,AllocationDate,Role,IsActive")]
ProjectAllocation projectAllocation)
    {
        if (id != projectAllocation.AllocationId)
        {
            return NotFound();
        }

        if (ModelState.IsValid)
        {
            try
            {
                _context.Update(projectAllocation);
                await _context.SaveChangesAsync();
            }
            catch (DbUpdateConcurrencyException)
            {
```

```
                if (!ProjectAllocationExists(projectAllocation.AllocationId))
                {
                    return NotFound();
                }
                else
                {
                    throw;
                }
            }
            return RedirectToAction(nameof(Index));
        }
        ViewData["EmployeeId"] = new SelectList(_context.Employees, "EmployeeId",
"EmployeeName", projectAllocation.EmployeeId);
        ViewData["ProjectId"] = new SelectList(_context.Projects, "ProjectId",
"ProjectName", projectAllocation.ProjectId);
        return View(projectAllocation);
    }

    // GET: ProjectAllocations/Delete/5
    public async Task<IActionResult> Delete(int? id)
    {
        if (id == null)
        {
            return NotFound();
        }

        var projectAllocation = await _context.ProjectAllocations
            .Include(p => p.Employee)
            .Include(p => p.Project)
            .FirstOrDefaultAsync(m => m.AllocationId == id);
        if (projectAllocation == null)
        {
            return NotFound();
        }

        return View(projectAllocation);
    }

    // POST: ProjectAllocations/Delete/5
```

```
        [HttpPost, ActionName("Delete")]
        [ValidateAntiForgeryToken]
        public async Task<IActionResult> DeleteConfirmed(int id)
        {
            var projectAllocation = await _context.ProjectAllocations.FindAsync(id);
            if (projectAllocation != null)
            {
                _context.ProjectAllocations.Remove(projectAllocation);
            }

            await _context.SaveChangesAsync();
            return RedirectToAction(nameof(Index));
        }

        private bool ProjectAllocationExists(int id)
        {
            return _context.ProjectAllocations.Any(e => e.AllocationId == id);
        }
    }
}
```

SearchByProjectName.cshtml

```
<form asp-action="SearchByProjectName">
    <div class="form-group">
        <label for="productName">Project Name:</label>
        <input type="text" class="form-control" id="projectName" name="projectName"
required />
    </div>
    <button type="submit" class="btn btn-primary">Search</button>
</form>
```

SearchResult.html

```
@model IEnumerable<Assignment_2_2.Models.Employee>

@{
```

```
    ViewData["Title"] = "Search Result";
    Layout = "~/Views/Shared/_Layout.cshtml";
}

<h1>Search Result</h1>

<p>
    <a asp-action="Create">Create New Employee</a>
</p>

<table class="table">
    <thead>
        <tr>
            <th>@Html.DisplayNameFor(model => model.First().EmployeeName)</th>
            <th>@Html.DisplayNameFor(model => model.First().Email)</th>
            <th>@Html.DisplayNameFor(model => model.First().Department)</th>
            <th>@Html.DisplayNameFor(model => model.First().JoiningDate)</th>
            <th>Projects</th>
            <th></th>
        </tr>
    </thead>
    <tbody>
@foreach (var employee in Model)
{
    <tr>
        <td>@Html.DisplayFor(m => employee.EmployeeName)</td>
        <td>@Html.DisplayFor(m => employee.Email)</td>
        <td>@Html.DisplayFor(m => employee.Department)</td>
        <td>@Html.DisplayFor(m => employee.JoiningDate)</td>
        <td>
            @foreach(var alloc in employee.ProjectAllocations)
            {
                @alloc.Project.ProjectName <br />
            }
        </td>
        <td>
            <a asp-action="Edit" asp-route-id="@employee.EmployeeId">Edit</a> |
            <a asp-action="Details" asp-route-id="@employee.EmployeeId">Details</a> |
            <a asp-action="Delete" asp-route-id="@employee.EmployeeId">Delete</a>
```

```
        </td>
    </tr>
}
    </tbody>
</table>
```

Shared/_Layout.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>@ViewData["Title"] - Assignment_2_2</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="~/Assignment_2_2.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">Assignment_2_2</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="navbar-collapse collapse d-sm-inline-flex justify-content-between">
                    <ul class="navbar-nav flex-grow-1">
                        <li class="nav-item">
                            <a class="nav-link text-dark" asp-area="" asp-controller="Home"
asp-action="Index">Home</a>
                        </li>
                        <li class="nav-item">
```

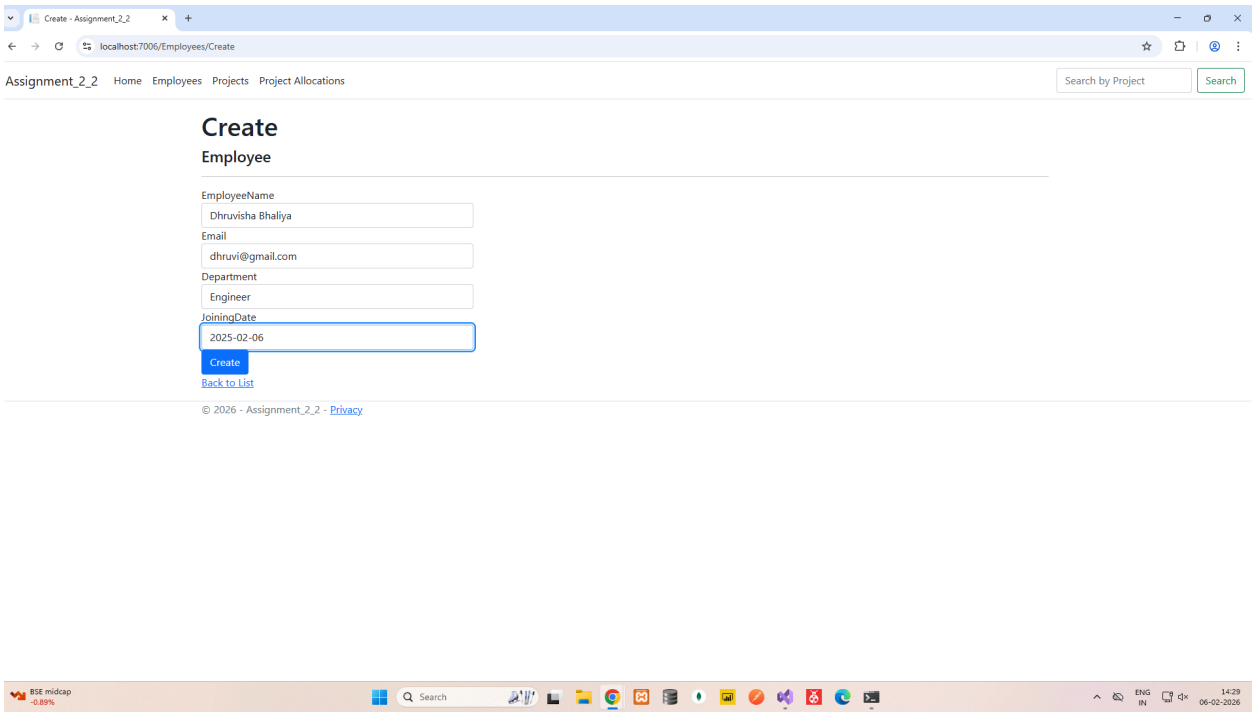
```
                    <a class="nav-link text-dark" asp-controller="Employees"
asp-action="Index">Employees</a>
                </li>
                <li class="nav-item">
                    <a class="nav-link text-dark" asp-controller="Projects"
asp-action="Index">Projects</a>
                </li>
                <li class="nav-item">
                    <a class="nav-link text-dark" asp-controller="ProjectAllocations"
asp-action="Index">Project Allocations</a>
                </li>
            </ul>
            <form class="d-flex" asp-controller="Employees"
asp-action="SearchByProjectName" method="post">
                <input class="form-control me-2" type="text" name="projectName"
placeholder="Search by Project" />
                <button class="btn btn-outline-success" type="submit">Search</button>
            </form>

        </div>
    </div>
  </nav>
 </header>
 <div class="container">
  <main role="main" class="pb-3">
    @RenderBody()
  </main>
 </div>

 <footer class="border-top footer text-muted">
  <div class="container">
    &copy; 2026 - Assignment_2_2 - <a asp-area="" asp-controller="Home"
asp-action="Privacy">Privacy</a>
  </div>
 </footer>
 <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)
```

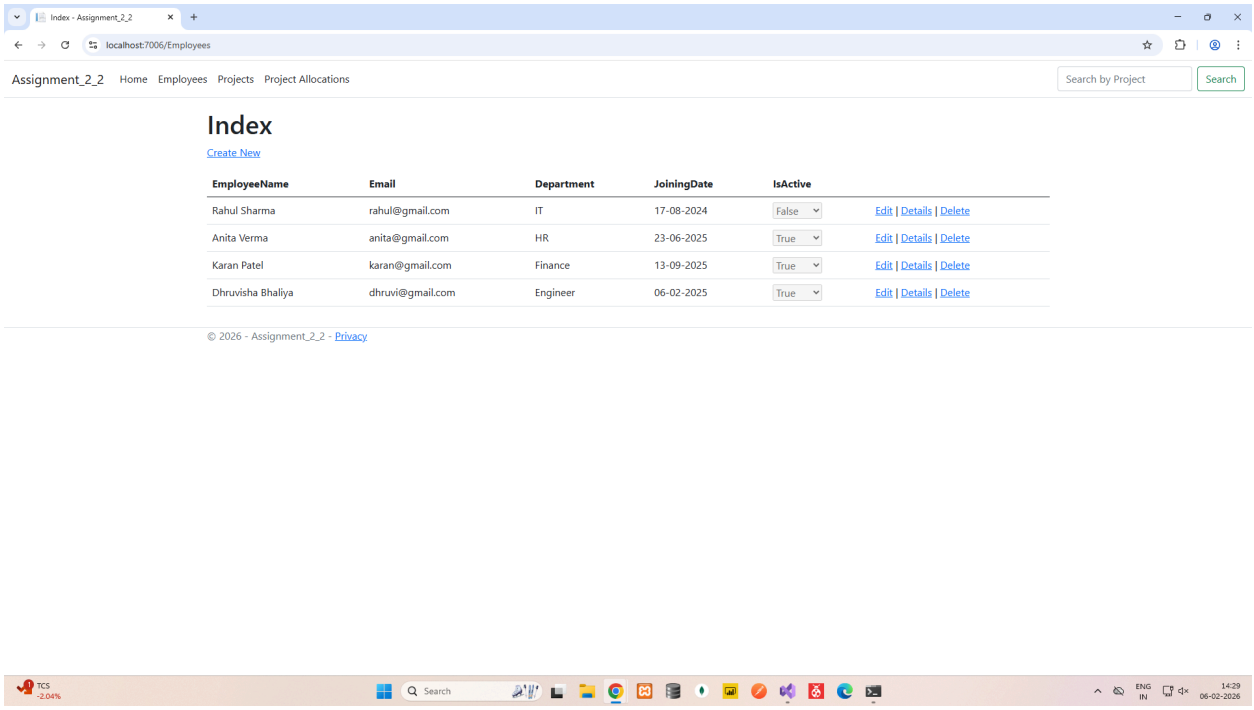
```
</body>
</html>
```

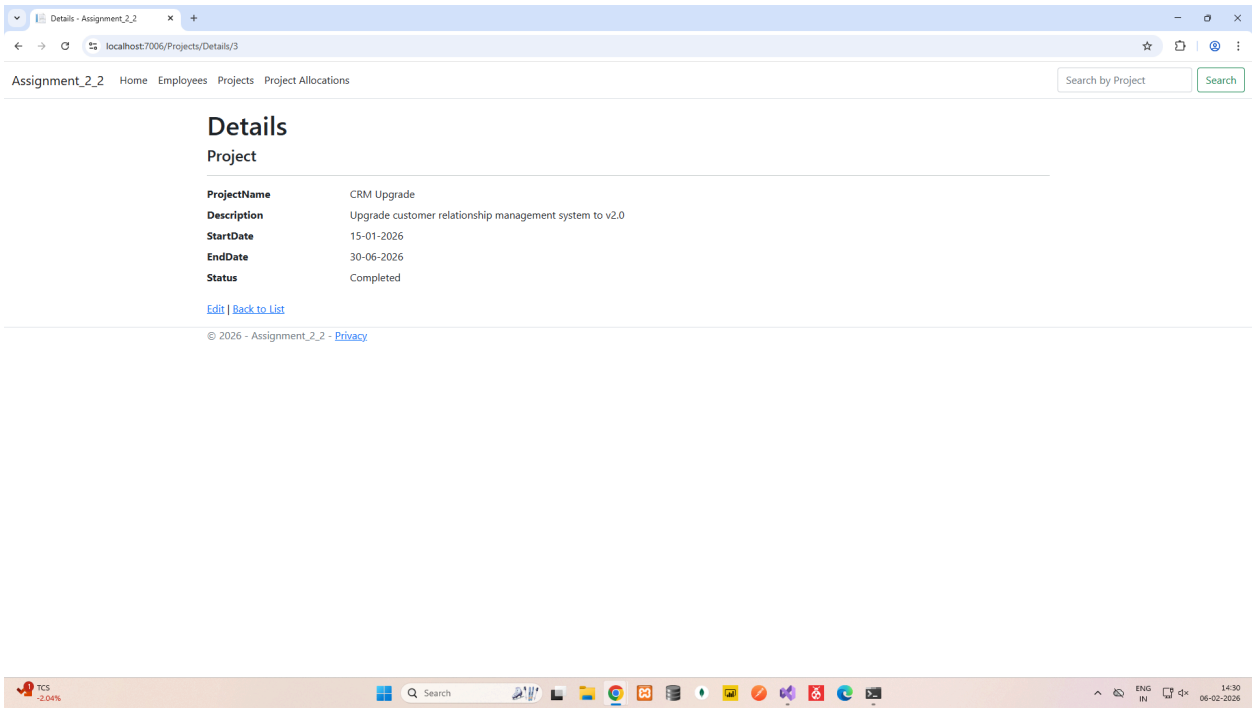
Appsettings.json

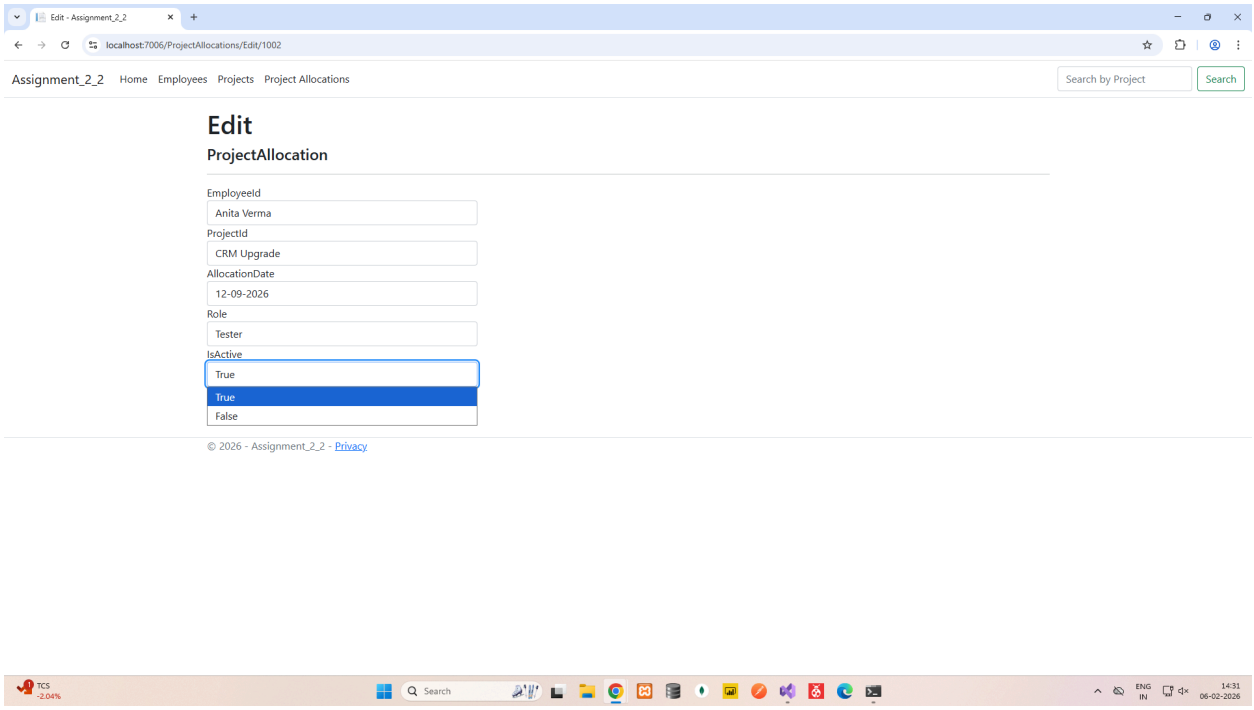
```
{
  "Logging": {
    "LogLevel": {
      "Default": "Information",
      "Microsoft.AspNetCore": "Warning"
    }
  },
  "AllowedHosts": "*",
  "ConnectionStrings": {
    "ProjectAllocateString": "Data Source=DESKTOP-E6KULOA;Initial
Catalog=ICT2ProjectAllocationDB;Integrated Security=True;Trust Server
Certificate=True"
  }
}
```

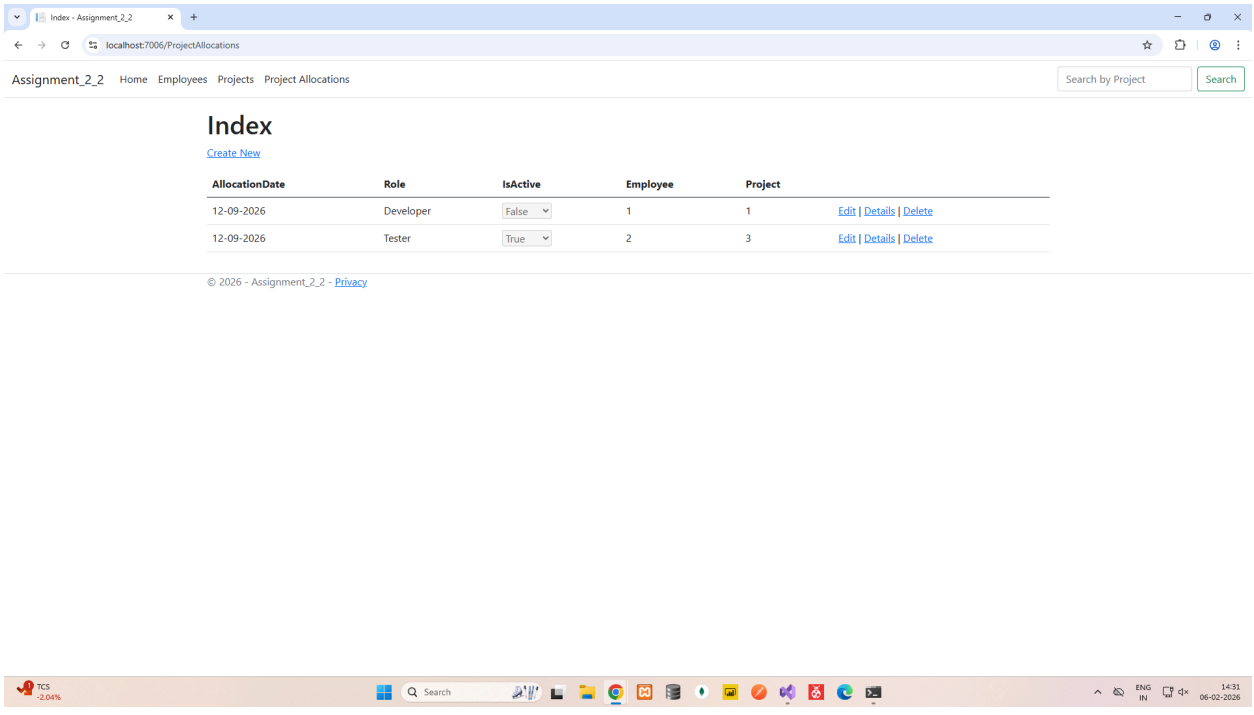
Output

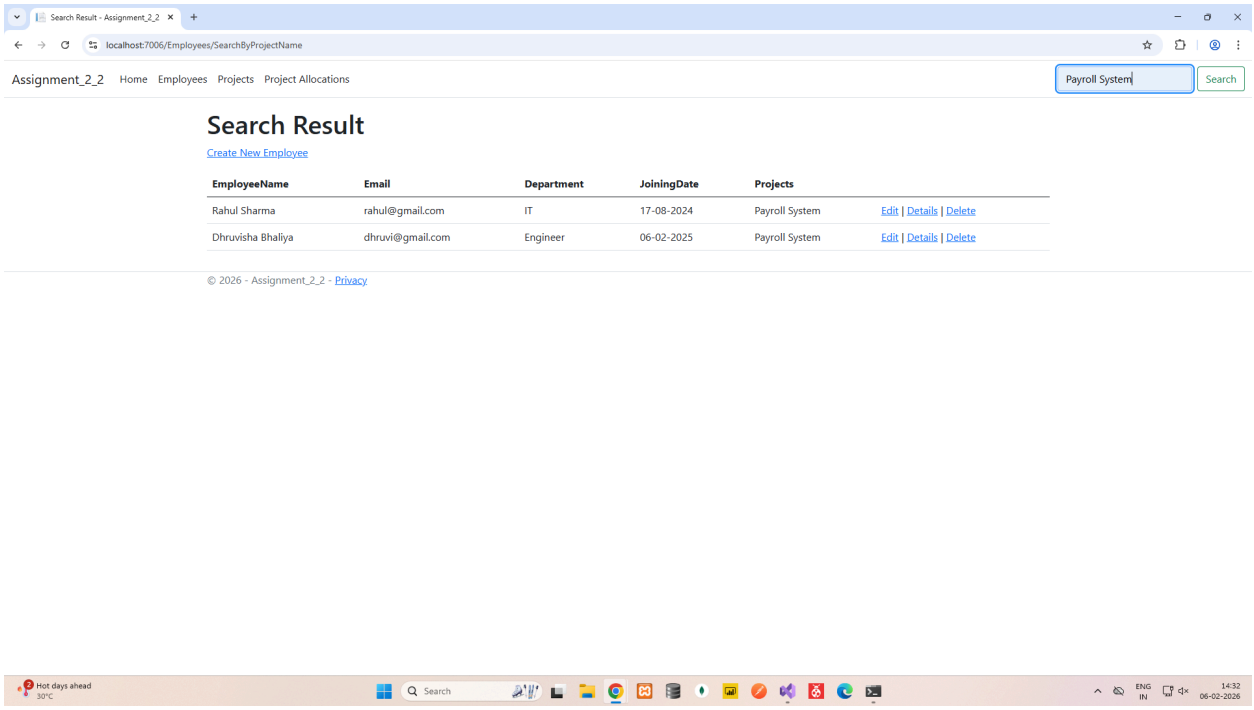



Index - Assignment_2_2
localhost:7006/Employees
Assignment_2_2
Home
Employees
Projects
Project Allocations
Search by Project
Search
Index
Create New
EmployeeName
Email
Department
JoiningDate
IsActive
Rahul Sharma
rahul@gmail.com
IT
17-08-2024
False
Edit | Details | Delete
Anita Verma
anita@gmail.com
HR
23-06-2025
True
Edit | Details | Delete
Karan Patel
karan@gmail.com
Finance
13-09-2025
True
Edit | Details | Delete
Dhruvisha Bhaliya
dhruvi@gmail.com
Engineer
06-02-2025
True
Edit | Details | Delete
© 2026 - Assignment_2_2 - Privacy

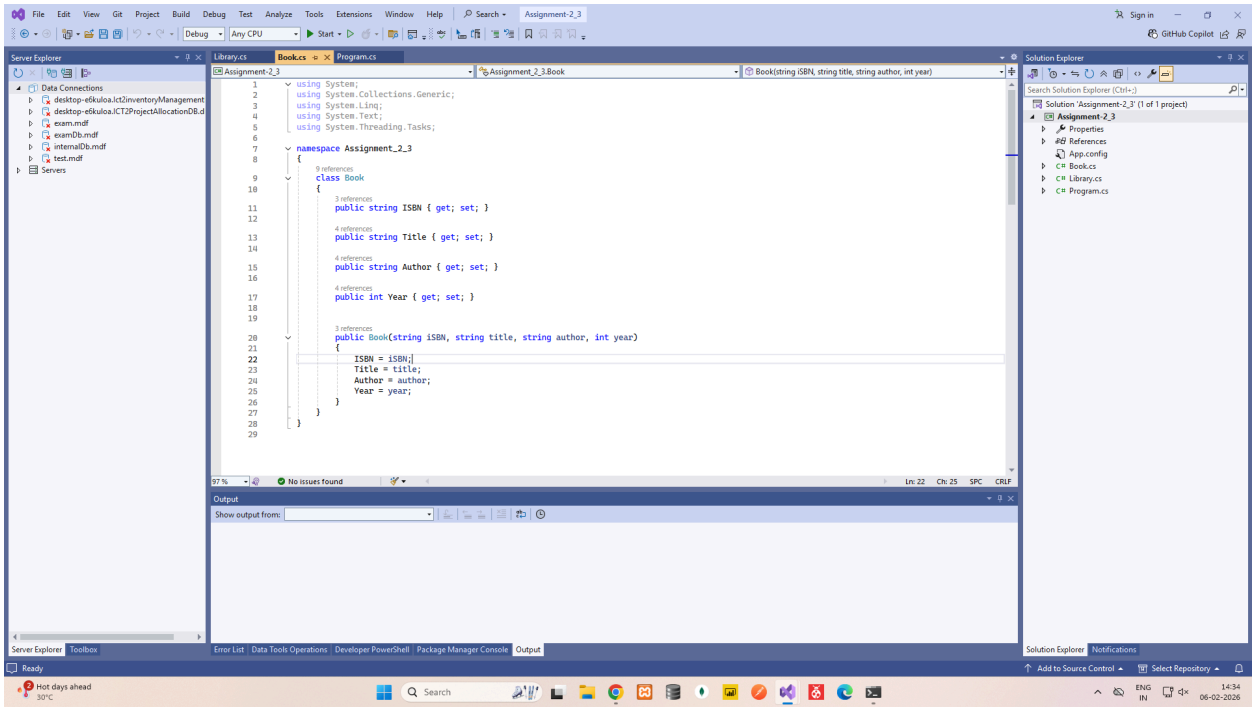

Details - Assignment_2_2
localhost:7006/Projects/Details/3
Assignment_2_2
Home
Employees
Projects
Project Allocations
Search by Project
Search
Details
Project
ProjectName
CRM Upgrade
Description
Upgrade customer relationship management system to v2.0
StartDate
15-01-2026
EndDate
30-06-2026
Status
Completed
Edit | Back to List
© 2026 - Assignment_2_2 - Privacy

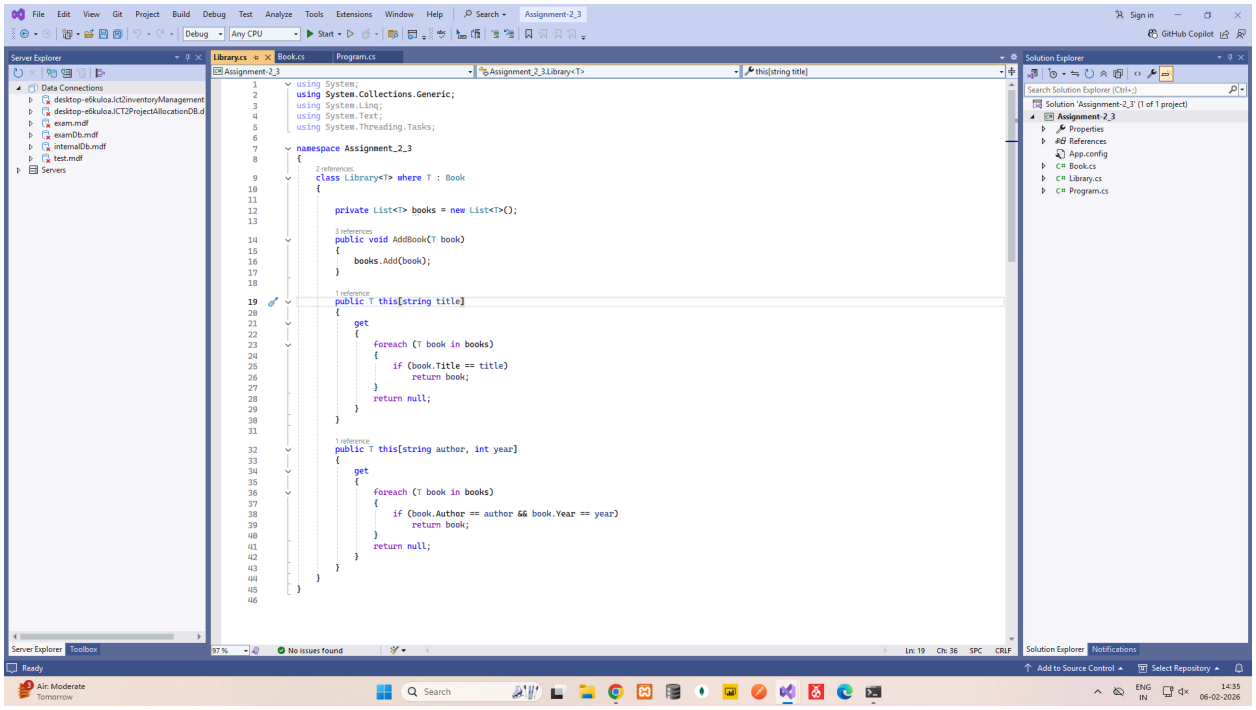

Edit - Assignment_2_2
localhost:7006/ProjectAllocations/Edit/1002
Assignment_2_2
Home
Employees
Projects
Project Allocations
Search by Project
Search
Edit
ProjectAllocation
EmployeeId
Anita Verma
ProjectId
CRM Upgrade
AllocationDate
12-09-2026
Role
Tester
IsActive
True
True
False
© 2026 - Assignment_2_2 - Privacy


Index - Assignment_2_2
localhost:7006/ProjectAllocations
Assignment_2_2
Home
Employees
Projects
Project Allocations
Search by Project
Search
Index
Create New
AllocationDate
Role
IsActive
Employee
Project
12-09-2026
Developer
False
1
1
Edit | Details | Delete
12-09-2026
Tester
True
2
3
Edit | Details | Delete
© 2026 - Assignment_2_2 - Privacy

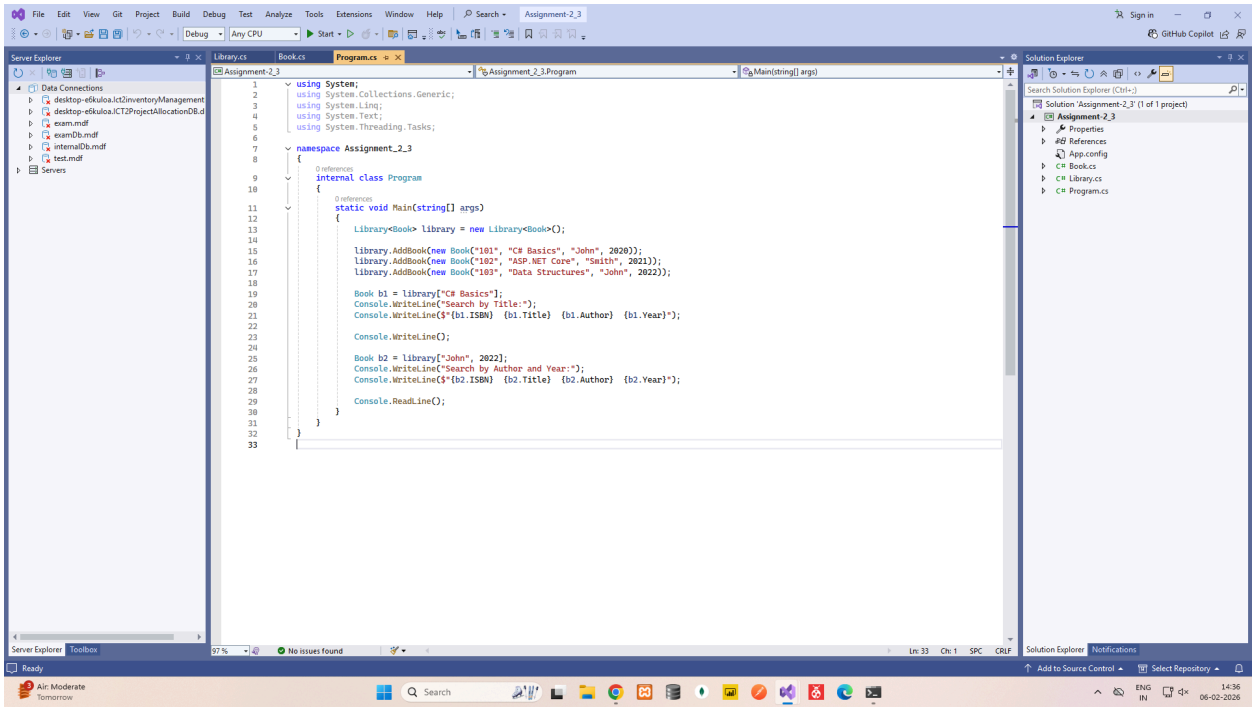


3) Demonstrate use of String Indexer and multivalued Indexer to search data from a Generic collection.





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

namespace Assignment_2_3
{
    2 references
    class Library<T> where T : Book
    {

        private List<T> books = new List<T>();

        3 references
        public void AddBook(T book)
        {
            books.Add(book);
        }

        1 reference
        public T this[string title]
        {
            get
            {
                foreach (T book in books)
                {
                    if (book.Title == title)
                        return book;
                }
                return null;
            }
        }

        1 reference
        public T this[string author, int year]
        {
            get
            {
                foreach (T book in books)
                {
                    if (book.Author == author && book.Year == year)
                        return book;
                }
                return null;
            }
        }
    }
}
```



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

namespace Assignment_2_3
{
    0 references
    internal class Program
    {
        0 references
        static void Main(string[] args)
        {
            Library<Book> library = new Library<Book>();

            library.AddBook(new Book("101", "C# Basics", "John", 2020));
            library.AddBook(new Book("102", "ASP.NET Core", "Smith", 2021));
            library.AddBook(new Book("103", "Data Structures", "John", 2022));

            Book b1 = library["C# Basics"];
            Console.WriteLine("Search by Title:");
            Console.WriteLine($"{b1.ISBN}  {b1.Title}  {b1.Author}  {b1.Year}");

            Console.WriteLine();

            Book b2 = library["John", 2022];
            Console.WriteLine("Search by Author and Year:");
            Console.WriteLine($"{b2.ISBN}  {b2.Title}  {b2.Author}  {b2.Year}");

            Console.ReadLine();
        }
    }
}
```

Book.cs

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

namespace Assignment_2_3
{
   class Book
   {
      public string ISBN { get; set; }

      public string Title { get; set; }

      public string Author { get; set; }

      public int Year { get; set; }


      public Book(string iSBN, string title, string author, int year)
      {
         ISBN = iSBN;
         Title = title;
         Author = author;
         Year = year;
      }
   }
}
```

Library.cs

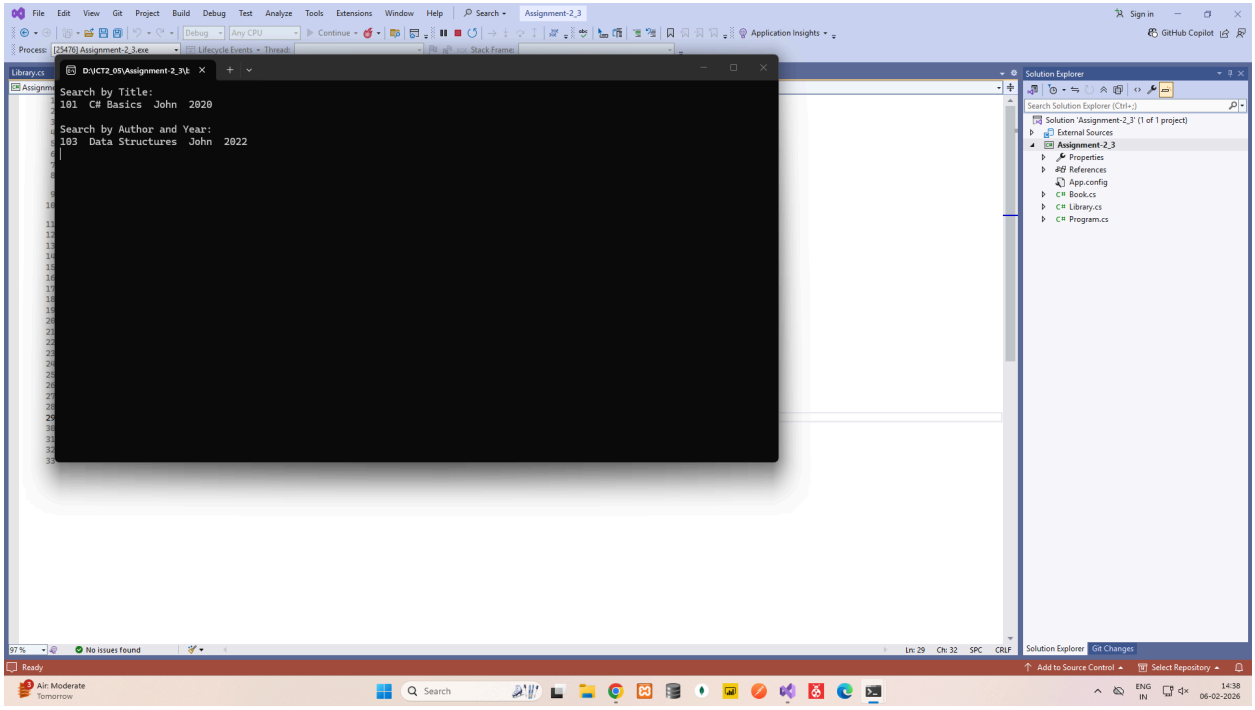
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
```

```
namespace Assignment_2_3
{
    class Library<T> where T : Book
    {

        private List<T> books = new List<T>();

        public void AddBook(T book)
        {
            books.Add(book);
        }

        public T this[string title]
        {
            get
            {
                foreach (T book in books)
                {
                    if (book.Title == title)
                        return book;
                }
                return null;
            }
        }

        public T this[string author, int year]
        {
            get
            {
                foreach (T book in books)
                {
                    if (book.Author == author && book.Year == year)
                        return book;
                }
                return null;
            }
        }
    }
}
```

Program.cs

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

namespace Assignment_2_3
{
    internal class Program
    {
        static void Main(string[] args)
        {
            Library<Book> library = new Library<Book>();

            library.AddBook(new Book("101", "C# Basics", "John", 2020));
            library.AddBook(new Book("102", "ASP.NET Core", "Smith", 2021));
            library.AddBook(new Book("103", "Data Structures", "John", 2022));

            Book b1 = library["C# Basics"];
            Console.WriteLine("Search by Title:");
            Console.WriteLine($"{b1.ISBN}  {b1.Title}  {b1.Author}  {b1.Year}");

            Console.WriteLine();

            Book b2 = library["John", 2022];
            Console.WriteLine("Search by Author and Year:");
            Console.WriteLine($"{b2.ISBN}  {b2.Title}  {b2.Author}  {b2.Year}");

            Console.ReadLine();
        }
    }
}
```

Output


Search by Title:
101 C# Basics John 2020
Search by Author and Year:
103 Data Structures John 2022