

## **Problem Statement:**

**Create a Web API Core application with a static collection for an Employee**

**To View WebAPI\_CRUD\_Project Through Git follow this link**

[https://github.com/SadwaleShivaji-donet-Hyd/WebAPICore\\_Collection\\_CRUD\\_EmployeeModel.git](https://github.com/SadwaleShivaji-donet-Hyd/WebAPICore_Collection_CRUD_EmployeeModel.git)

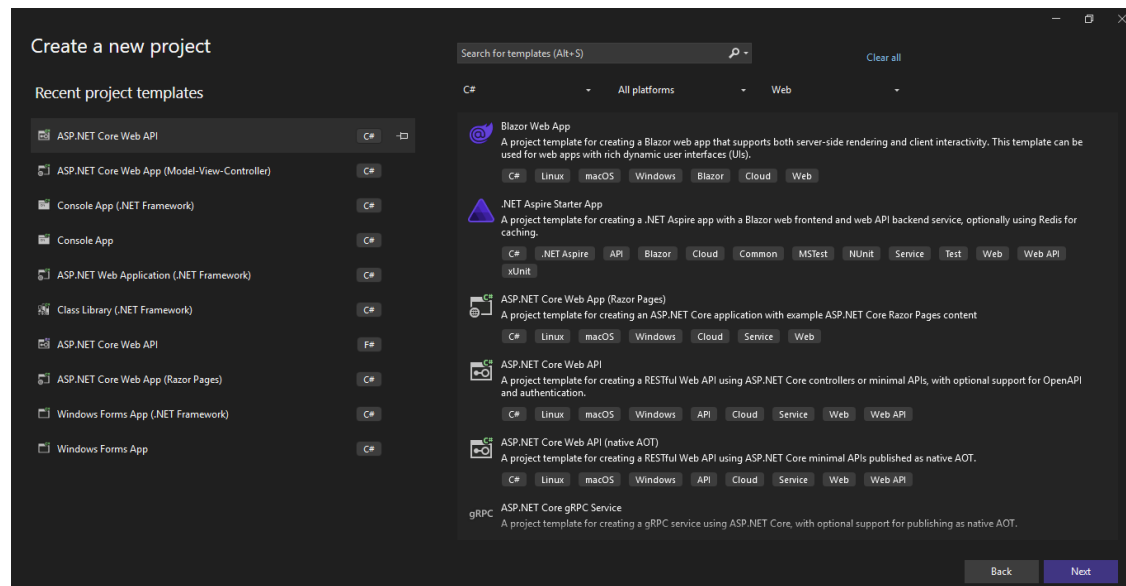
**To View ClientHTTPApplication\_Project Through Git follow this link**

[https://github.com/SadwaleShivaji-donet-Hyd/HttpClientApplication\\_CRUD/WebAPICore.git](https://github.com/SadwaleShivaji-donet-Hyd/HttpClientApplication_CRUD/WebAPICore.git)

### **1)Creating Project.**

Creating WebAPI Application for the CRUD operation.

Open Visual Studio ->Create a new Project->ASP.Net Core Web Api



**Click on Next**

Configure your new project

ASP.NET Core Web API C# Linux macOS Windows API Cloud Service Web Web API

Project name  
WebAPICore\_Collection\_CRUD\_EmployeeModel

Location  
C:\Users\Sadwale.Shivaji\OneDrive - ENCORA\HandsOnPractice

Solution name  
WebAPICore\_Collection\_CRUD\_EmployeeModel

☐ Place solution and project in the same directory

Project will be created in "C:\Users\Sadwale.Shivaji\OneDrive - ENCORA\HandsOnPractice\WebAPICore\_Collection\_CRUD\_EmployeeModel\WebAPICore\_Collection\_CRUD\_EmployeeModel"

Back Next

Click on Next

Disable Configure for HTTPS

Additional information

ASP.NET Core Web API C# Linux macOS Windows API Cloud Service Web Web API

Framework  
.NET 8.0 (Long Term Support)

Authentication type  
None

☐ Configure for HTTPS

☐ Enable container support

Container OS  
Linux

Container build type  
Dockerfile

☒ Enable OpenAPI support

☐ Do not use top-level statements

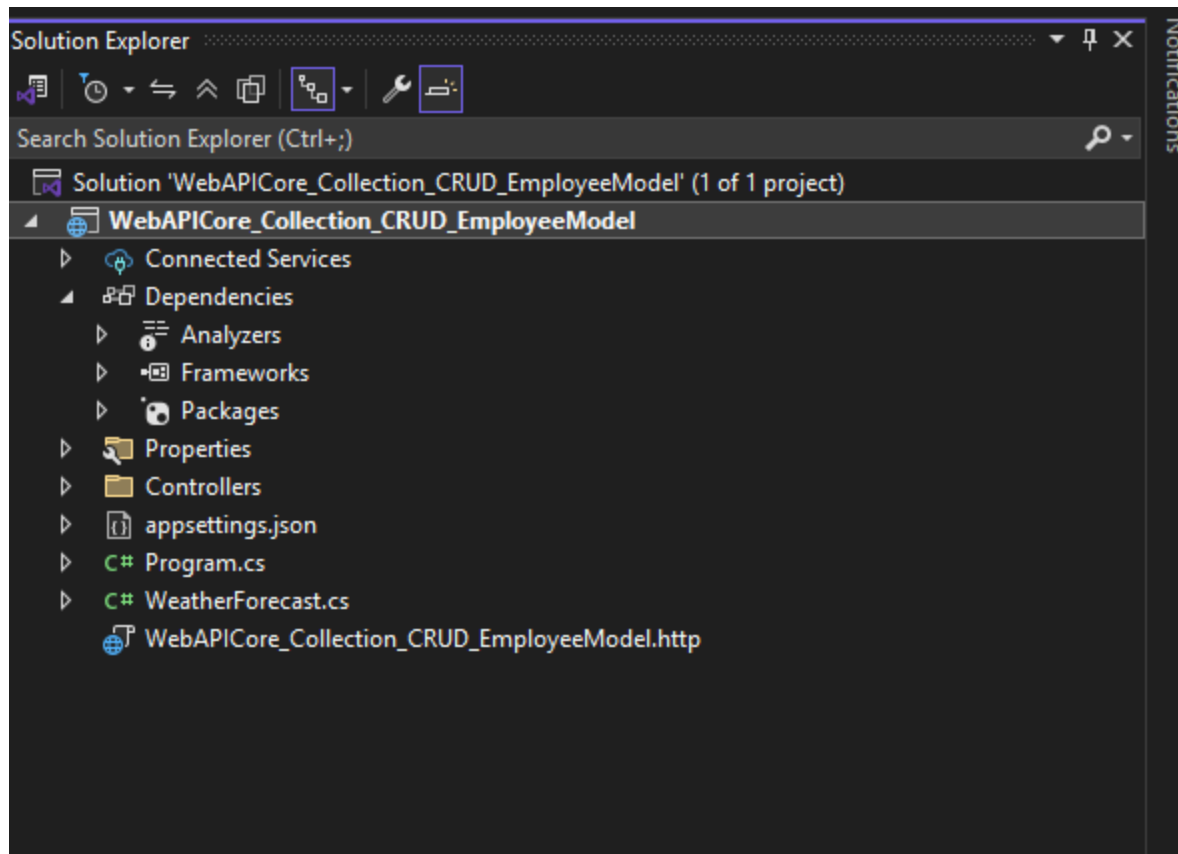
☒ Use controllers

☐ Enlist in .NET Aspire orchestration

Aspire version  
9.2

Back Create

Initial Project Structure:



**2)Creating Models folder. Click on project ->Add->New Folder->Name as Models**

Then Create a class ->Employee.cs

1. Employee Model has the following fields.

- Id (mandatory)
- Name (min 3 letters and max 30 letters)
- Department
- MobileNo (only 10 digits allowed)
- Email (proper email id)

using System.ComponentModel.DataAnnotations;

```

namespace WebAPICore_Collection_CRUD_EmployeeModel.Models {

public class Employee {

[Required(ErrorMessage = "Id is Required")]

public int Id { get; set; }

    [Required(ErrorMessage = "Name is Required")]
    [StringLength(30, MinimumLength = 3, ErrorMessage = "Name Should
be Between 3 to 30 letter")]
    public string Name { get; set; }
    public string? Department { get; set; }

    [Required(ErrorMessage = "Mobile number is required.")]
    [RegularExpression(@"^\d{10}$", ErrorMessage = "Mobile number must
be exactly 10 digits.")]

    public string MobileNo { get; set; }

    [EmailAddress(ErrorMessage = "Invalid email format.")]
    public string Email { get; set; }
}

}

```

### 3)Creating a folder **Repository** .

Repository folder has

#### 1)**IEmployeeRepository** (Interface)

Defines the methods for employee-related operations.

```

using WebAPICore_Collection_CRUD_EmployeeModel.Models;

namespace WebAPICore_Collection_CRUD_EmployeeModel.Repository
{
    4 references
    public interface IEmployeeRepository
    {
        2 references
        IEnumerable<Employee> GetAllEmployees();
        2 references
        Employee GetEmployeeById(int id);
        2 references
        public void AddEmployee(Employee employee);
        2 references
        public void UpdateEmployee(Employee employee);
        2 references
        public void DeleteEmployee(int id);
        2 references
        public void UpdateEmployeeEmail(int id, string email);
        2 references
        IEnumerable<Employee> GetEmployeesByDept(string dept);
        4 references
        public bool Exists(int id);
    }
}

```

## 2. EmployeeRepository (Implements IEmployeeRepository)

This class contains the actual implementation of the interface.

Uses a static in-memory list of employees to simulate data storage.

All CRUD operations are defined here.

```

using WebAPICore_Collection_CRUD_EmployeeModel.Models;
using Microsoft.AspNetCore.Mvc;
namespace WebAPICore_Collection_CRUD_EmployeeModel.Repository
{
    1 reference
    public class EmployeeRepository : IEmployeeRepository
    {
        static List<Employee> employees = new List<Employee>()
        {
            new Employee() { Id=1, Name="Akhil", Department="IT", MobileNo="9812889213", Email="Akhil@gmail.com" },
            new Employee() { Id=2, Name="Suraj", Department = "IT", MobileNo = "9812889213", Email = "Suraj@gmail.com" },
            new Employee() { Id=3, Name="Murthy", Department = "Finance", MobileNo = "9819889213", Email = "Murthy@gmail.com" }
        };
        2 references
        public void AddEmployee(Employee employee)
        {
            employees.Add(employee);
        }

        2 references
        public void DeleteEmployee(int id)
        {
            var emp= employees.FirstOrDefault(e => e.Id == id);
            if(emp != null)
            {
                employees.Remove(emp);
            }
        }

        //checking if employees exists
        4 references
        public bool Exists(int id)
        {
            return employees.Any(e => e.Id == id);
        }

        2 references
        public IEnumerable<Employee> GetAllEmployees()
        {
            return employees;
        }
    }
}

```

```

2 references
public IEnumerable<Employee> GetAllEmployees()
{
    return employees;
}

2 references
public Employee GetEmployeeById(int id)
{
    var emp= employees.FirstOrDefault(e => e.Id == id);
    return emp;
}

2 references
public IEnumerable<Employee> GetEmployeesByDept(string dept)
{
    var emp= employees.Where(e => e.Department == dept).ToList();
    return emp;
}

2 references
public void UpdateEmployee(Employee employee)
{
    var emp= employees.FirstOrDefault(e => e.Id == employee.Id);
    if(emp != null)
    {
        emp.Name = employee.Name;
        emp.Department = employee.Department;
        emp.MobileNo = employee.MobileNo;
        emp.Email = employee.Email;
    }
}

2 references
public void UpdateEmployeeEmail(int id, string email)
{
    var emp= employees.FirstOrDefault(e => e.Id == id);
    if(emp != null)
    {
        emp.Email = email;
    }
}

```

4. Creating an API Controller->**EmployeeController** which contains all the methods like :

#### Employees

GET	/api/Employees	⌵
POST	/api/Employees	⌵
GET	/api/Employees/{id}	⌵
DELETE	/api/Employees/{id}	⌵
PUT	/api/Employees/{id}	⌵
GET	/api/Employees/department/{Dept}	⌵
PATCH	/api/Employees/{id}/email	⌵

#### WeatherForecast

GET	/WeatherForecast	⌵
-----	------------------	---

Method	Route	Description
GET	/api/employee	Get all employees

GET	/api/employee/{id}	Get employee by ID
GET	/api/employee/department/{dept}	Get employees by department
POST	/api/employee	Add a new employee
PUT	/api/employee/{id}	Update an employee (full update)
PATCH	/api/employee/{id}	Partial update (e.g. just email)
DELETE	/api/employee/{id}	Delete an employee

```

using Microsoft.AspNetCore.Http;
using Microsoft.AspNetCore.Mvc;
using WebAPICore_Collection_CRUD_EmployeeModel.Models;
using WebAPICore_Collection_CRUD_EmployeeModel.Repository;

namespace WebAPICore_Collection_CRUD_EmployeeModel.Controllers
{
    [Route("api/[controller]")]
    [ApiController]
    1 reference
    public class EmployeesController : ControllerBase
    {
        private readonly IEmployeeRepository _repo;
        0 references
        public EmployeesController(IEmployeeRepository repo)
        {
            _repo=repo;
        }
        [HttpGet]
        0 references
        public IActionResult GetAllEmployees()
        {
            return Ok(_repo.GetAllEmployees());
        }

        [HttpGet("{id}")]
        1 reference
        public IActionResult GetEmployeesById([FromRoute] int id)
        {
            var employee=_repo.GetEmployeeById(id);
            if(employee==null)
            {
                return BadRequest("Employee Id doesnt exists ! Try with Correct Id");
            }
            return Ok(employee);
        }
        [HttpDelete("{id}")]
        0 references
        public IActionResult DeleteEmp([FromRoute] int id)
        {
            if (!_repo.Exists(id))
                return NotFound();

            _repo.DeleteEmployee(id);
            return NoContent();
        }
    }
}

```



```

[HttpPost]
0 references
public IActionResult Create([FromBody] Employee employee)
{
    _repo.AddEmployee(employee);
    return CreatedAtAction(nameof(GetEmployeesById), new { id = employee.Id }, employee);
}

[HttpGet("department/{Dept}")]
0 references
public IActionResult GetByEmail(string Dept)
{
    var employees = _repo.GetEmployeesByDept(Dept);
    if (employees == null || !employees.Any())
    {
        return NotFound("No employees found in the specified department.");
    }
    return Ok(employees);
}

[HttpPut("{id}")]
0 references
public IActionResult Update(int id, Employee employee)
{
    if (id != employee.Id)
        return BadRequest("Id mismatch");

    if (!_repo.Exists(id))
        return NotFound();

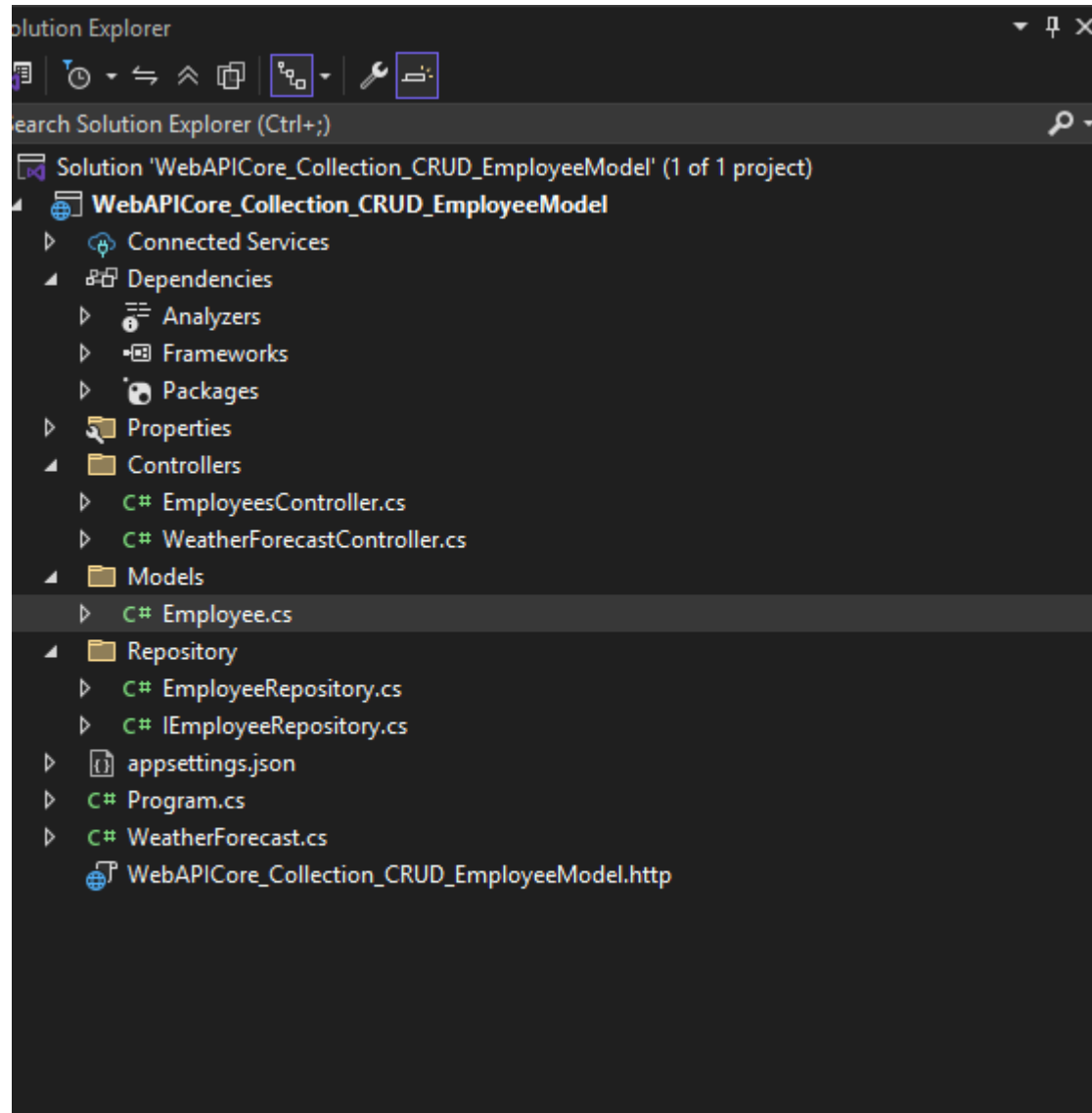
    _repo.UpdateEmployee(employee);
    return NoContent();
}

[HttpPatch("{id}/email")]
0 references
public IActionResult UpdateEmail(int id, [FromBody] string email)
{
    if (!_repo.Exists(id))
        return NotFound();

    _repo.UpdateEmployeeEmail(id, email);
    return NoContent();
}
}
}

```

## 5) Full Structure of Project



## 6) Building project and running it

Initial Setup After running in the project

### WebAPICore\_Collection\_CRUD\_EmployeeModel

1.0 OAS 3.0

<http://localhost:5288/swagger/v1/swagger.json>

#### Employees

GET

/api/Employees

⌵

POST

/api/Employees

⌵

GET

/api/Employees/{id}

⌵

DELETE

/api/Employees/{id}

⌵

PUT

/api/Employees/{id}

⌵

GET

/api/Employees/department/{Dept}

⌵

PATCH

/api/Employees/{id}/email

⌵

## 7) Testing the Application

- **GetAllEmployees- Click on Try It Out ->Execute**

### Employees

GET

/api/Employees

Parameters

Try it out

No parameters

Responses

Server response

Code

Details

200

Response body

```
{
  "id": 1,
  "name": "Akhil",
  "department": "IT",
  "mobileNo": "9012809213",
  "email": "Akhil@gmail.com"
},
{
  "id": 2,
  "name": "Suraj ",
  "department": "IT",
  "mobileNo": "9012809213",
  "email": "Suraj@gmail.com"
},
{
  "id": 3,
  "name": "Murthy",
  "department": "Finance",
  "mobileNo": "9019809213",
  "email": "ram@gmail.com"
}
]
```

Download

Response headers

```
content-type: application/json; charset=utf-8
date: Wed, 08 Oct 2025 11:13:04 GMT
server: Kestrel
transfer-encoding: chunked
```

Generated Output

```
{
  "id": 1,
  "name": "Akhil",
  "department": "IT",
  "mobileNo": "9012809213",
  "email": "Akhil@gmail.com"
},
{
  "id": 2,
  "name": "Suraj ",
  "department": "IT",
  "mobileNo": "9012809213",
```

```

"email": "Suraj@gmail.com"
},
{
  "id": 3,
  "name": "Murthy",
  "department": "Finance",
  "mobileNo": "9019809213",
  "email": "ram@gmail.com"
}

```

## Add Employee

It Gives the default template for adding-> Now u can change According

The screenshot shows a REST client interface with a POST request to `/api/Employees`. The 'Parameters' tab is active, showing 'No parameters'. The 'Request body' tab is also active, showing a default JSON body: `{ "id": 0, "name": "string", "department": "string", "mobileNo": "2782393263", "email": "user@example.com" }`. The 'Request body' dropdown is set to 'application/json'.

Creating a employee with the following

```

{
  "id": 5,
  "name": "Prakash",
  "department": "AIML",
  "mobileNo": "9882393263",
  "email": "Prakash@gmail.com"
}

```

Now Click on Execute

The screenshot shows the REST client interface after executing the POST request. The 'Request URL' is `http://localhost:5288/api/Employees`. The 'Server response' tab is active, showing a 201 status code. The 'Response body' tab is also active, showing the JSON response: `{ "id": 5, "name": "Prakash", "department": "AIML", "mobileNo": "9882393263", "email": "Prakash@gmail.com" }`. The 'Response headers' tab is also active, showing headers: `content-type: application/json; charset=utf-8, date: Wed, 08 Oct 2020 11:18:18 GMT, location: http://localhost:5288/api/Employees/5, server: Kestrel, transfer-encoding: chunked`. The 'Responses' table at the bottom shows a 200 OK response with no links.

Now Checking All Data Annotation for creating Employee ..

POST /api/Employees

Parameters

No parameters

Request body

application/json

```
{
  "id": 0,
  "name": "string",
  "department": "string",
  "mobileNo": "3196501325",
  "email": "user@example.com"
}
```

As phone is 10 digits and email should be standard giving phone as 8 digit and invalid email

```
{
  "id": 6,
  "name": "Karthik",
  "department": "Finance",
  "mobileNo": "31901325",
  "email": "user.com"
}
```

We will Get Error as

http://localhost:5288/api/Employees

Server response

Code	Details
400	Error: Bad Request

Response body

```
{
  "type": "https://tools.ietf.org/html/rfc9110#section-15.5.1",
  "title": "One or more validation errors occurred.",
  "status": 400,
  "errors": {
    "email": [
      "Invalid email format."
    ],
    "mobileNo": [
      "Mobile number must be exactly 10 digits."
    ]
  },
  "traceId": "00-62b5625a285c5a27b7a86c4a3a288ca3-0910ffa81d3c82c9-00"
}
```

Now Correcting them and executing with proper details

```
{
  "id": 6,
  "name": "Karthik",
  "department": "Finance",
  "mobileNo": "9871901325",
  "email": "user@gmail.com"
}
```

Server response


Code

Details

201  
*Undocumented*

Response body

```
{
  "id": 6,
  "name": "Karthik",
  "department": "Finance",
  "mobileNo": "9871981325",
  "email": "user@gmail.com"
}
```

 Download

Response headers

```
content-type: application/json; charset=utf-8
date: Wed,08 Oct 2025 11:22:54 GMT
location: http://localhost:5288/api/Employees/6
server: Kestrel
transfer-encoding: chunked
```

## GetEmployeeById

Parameters

Try it out

Name	Description
<b>id</b> * required integer(\$int32) (path)	<input type="text" value="id"/>

Click on Try it out and then Entering id and then execute

Parameters

Cancel

Name	Description
<b>id</b> * required integer(\$int32) (path)	<input type="text" value="6"/>

Execute

Clear

## Result

Server response

Code

Details

200

Response body

```
{
  "id": 6,
  "name": "Karthik",
  "department": "Finance",
  "mobileNo": "9871981325",
  "email": "user@gmail.com"
}
```

 Download

Response headers

```
content-type: application/json; charset=utf-8
date: Wed,08 Oct 2025 11:24:22 GMT
server: Kestrel
transfer-encoding: chunked
```

## DeleteEmpById

DELETE /api/Employees/{id}

Try it out

Name	Description
<b>id</b> * required integer(\$int32) (path)	<input type="text" value="id"/>

Enter Try It Out and Provide ID

Curl

```
curl -X 'DELETE' \
  'http://localhost:5288/api/Employees/3' \
  -H 'accept: */*'
```

Request URL

```
http://localhost:5288/api/Employees/3
```

Server response

Code	Details
204	Response headers
<i>Undocumented</i>	<pre>date: Wed,08 Oct 2025 11:39:44 GMT server: Kestrel</pre>

Responses

Code	Description
200	OK

Now checking whether the emp is deleted or not from getall

Server response

Code	Details
200	Response body
	<pre>{   "id": 1,   "name": "Akhil",   "department": "IT",   "mobileNo": "9912889213",   "email": "Akhil@gmail.com" }, {   "id": 2,   "name": "Suraj",   "department": "IT",   "mobileNo": "9912889213",   "email": "Suraj@gmail.com" }, {   "id": 3,   "name": "Prakash",   "department": "AIML",   "mobileNo": "9882393263",   "email": "Prakash@gmail.com" }, {   "id": 4,   "name": "Karthik",   "department": "finance",   "mobileNo": "987988325",   "email": "user@gmail.com" }</pre>

Response headers

Update Method (PUT)

Giving the wrong id and checkin the output



Name	Description
id <small>* required</small>	<input type="text" value="3"/>
integer(\$int32)	(path)

Request body application/json

```
{
  "id": 3,
  "name": "Avi",
  "department": "Finance",
  "mobileNo": "9086275810",
  "email": "Avi@example.com"
}
```

As id = 3 is already Deleted

Request URL

http://localhost:5288/api/Employees/3

Server response

Code	Details
404 <small>undocumented</small>	<p>Error: Not Found</p> <p>Response body</p> <pre>{   "type": "https://tools.ietf.org/html/rfc9110#section-15.5.5",   "title": "Not Found",   "status": 404,   "traceId": "00-330c5e0e3cb6afb3c84f15c6ae2dcb71-0ebb86876024f97c-00" }</pre> <p>Response headers</p> <pre>content-type: application/problem+json; charset=utf-8 date: Wed,08 Oct 2025 11:42:02 GMT server: Kestrel transfer-encoding: chunked</pre>

Responses

Giving Valid Id , Id =2

Before Updating

```
{
  "id": 2,
  "name": "Suraj ",
  "department": "IT",
  "mobileNo": "9012809213",
  "email": "Suraj@gmail.com"
},
```

After Updating

Request URL

http://localhost:5288/api/Employees/2

Server response

Code	Details
204 <small>undocumented</small>	<p>Response headers</p> <pre>date: Wed,08 Oct 2025 11:45:11 GMT server: Kestrel</pre>

Responses

Code	Description	Links
200	OK	No links

```
{
  "id": 2,
  "name": "Avi",
  "department": "Finance",
  "mobileNo": "9086275810",
  "email": "Avi@example.com"
},
{
```

GetEmployeeByDepartment

Giving dept=Finance

Parameters
Cancel

Name	Description
Dept * required string (path)	Finance

Execute
Clear

request URL
http://localhost:5288/api/Employees/department/Finance

Server response

Code	Details
200	Response body <pre>{   {     "id": 2,     "name": "Avi",     "department": "Finance",     "mobileNo": "9086275810",     "email": "Avi@example.com"   },   {     "id": 6,     "name": "Karthik",     "department": "Finance",     "mobileNo": "9871901325",     "email": "user@gmail.com"   } }</pre> Download

Giving Department Other than Created:

Dept=Hr

Code	Details
404 <i>Undocumented</i>	Error: Not Found Response body <pre>No employees found in the specified department.</pre>

## Updating Email ID

PATCH /api/Employees/{id}/email

Parameters

Cancel Reset

Name	Description
id * required	
integer(\$int32)	
(path)	

Request body

application/json

"Avi@gmail.com"

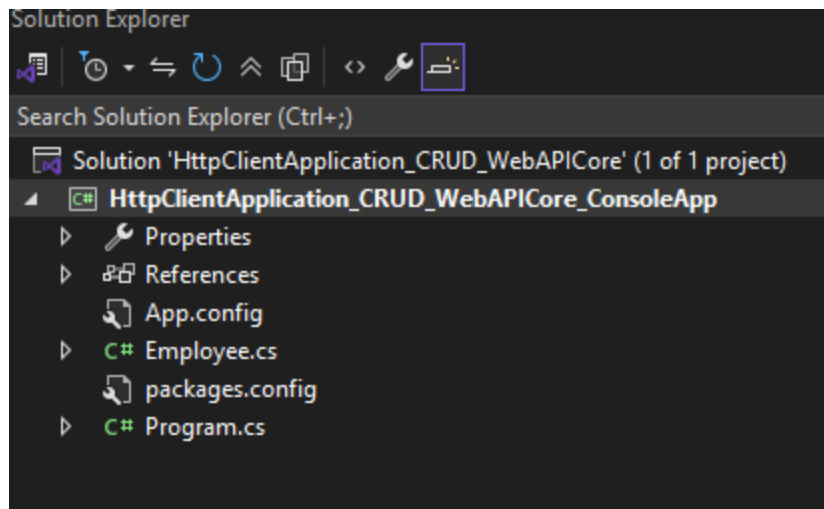
## BeforeUpdating

```
},  
{  
  "id": 2,  
  "name": "Avi",  
  "department": "Finance",  
  "mobileNo": "9086275810",  
  "email": "Avi@example.com"  
},  
{
```

```
},  
{  
  "id": 2,  
  "name": "Avi",  
  "department": "Finance",  
  "mobileNo": "9086275810",  
  "email": "Avi@gmail.com"  
},  
{
```

## Now Creating HttpClient Application

Create a Project->ConsoleApplication->Provide name and next  
Project Structure



Creating a Employee Class with the Same Field as the WebApi Project

```
namespace HttpClientApplication_CRUD_WebAPICore
{
    2 references
    internal class Employee
    {
        1 reference
        public int Id { get; set; }
        1 reference
        public string Name { get; set; }
        1 reference
        public string Department { get; set; }
        1 reference
        public string Email { get; set; }
        1 reference
        public string MobileNo { get; set; }
    }
}
```

Install System.Net.Http using Nuget Packet Manager

Now In the Project.cs

```
Program.cs x Employee.cs
HttpClientApplication_CRUD_WebAPICore_ConsoleApp v HttpClientApplication_CRUD_WebAPICore_ConsoleApp.Program v @Main(string[] args)
1 using HttpClientApplication_CRUD_WebAPICore;
2 using System;
3 using System.Collections.Generic;
4 using System.Linq;
5 using System.Net.Http;
6 using System.Net.Http.Json;
7 using System.Text;
8 using System.Threading.Tasks;
9
10 namespace HttpClientApplication_CRUD_WebAPICore_ConsoleApp
11 {
12     internal class Program
13     {
14         static async Task Main(string[] args)
15         {
16             string apiBaseUrl = "http://localhost:5288/api/Employees";
17             HttpClient client = new HttpClient();
18             try
19             {
20                 Console.WriteLine("Fetching the data from Web API");
21                 List<Employee> employees = await client.GetFromJsonAsync<List<Employee>>(apiBaseUrl);
22                 if (employees != null && employees.Count > 0)
23                 {
24                     Console.WriteLine("List of employees from Employee");
25                     foreach (var emp in employees)
26                     {
27                         Console.WriteLine("EmployeeId: " + emp.Id + " EmployeeName: " + emp.Name + " Employee Department " + emp.Department + " Employee MobileNo " + emp.MobileNo + " Employee Email "
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