

A black and white photograph of a long, narrow wooden corridor. The walls, ceiling, and floor are made of dark, horizontal wooden planks. At the far end of the corridor, there is a bright, rectangular opening that looks like a doorway or a window, creating a strong sense of perspective and depth. The lighting is dramatic, with the bright light at the end contrasting sharply with the dark wood.

Jon Hilton

From layers to vertical slices

Simplify your code and focus on your features

We build custom online software for
purpose-driven teams

LEARN MORE



📌 Pinned Tweet



Stroke Active @StrokeActive · 19h

'Innovation of The Year' Thank you to all that voted. We are absolutely delighted to receive this award @NeuroConvention 2019. #winner #strokeactive #innovation







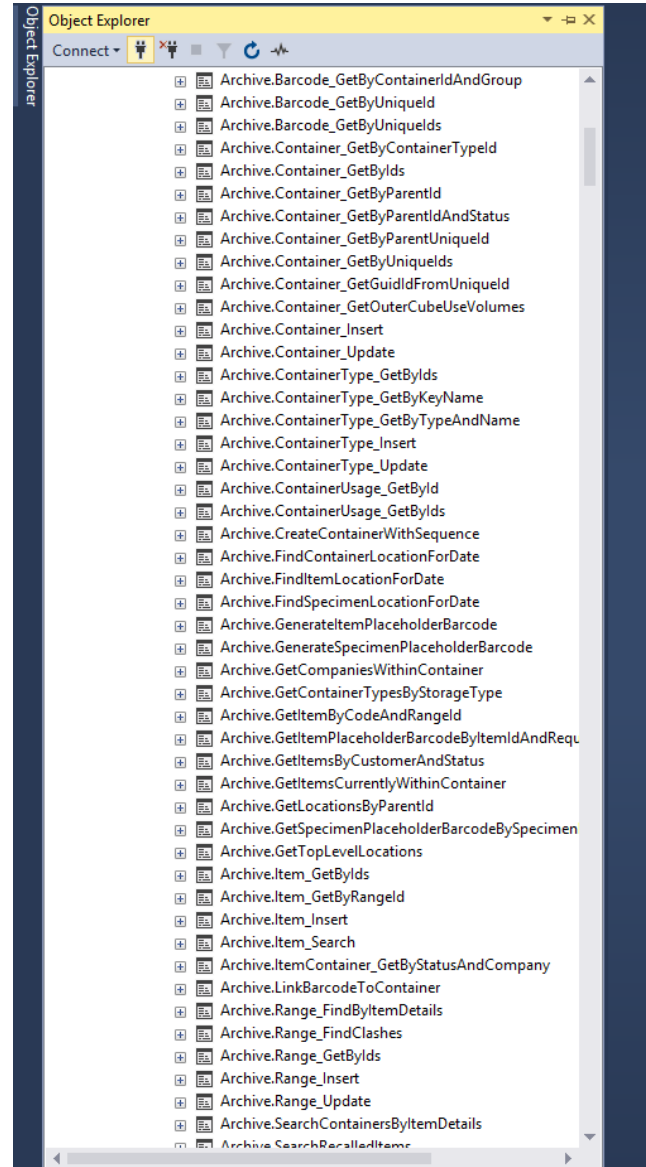
Could you just... ?

MIND THE GAP



- ▶   CellTrak.DataItems.Tests
- ▶   CellTrak.Legacy.Tests
- ▶   CellTrak.Operations.Tests
- ▶   CellTrak.Repositories.Test
- ▶   CellTrak.Services.Tests
- ▶   CellTrak.Tests
- ▶   CellTrak.Tools.Tests
- ▶   CellTrak.UI.Tests
- ▶   Languages.Tests
- ▶   Standard.Toolkit.Tests

◀  Websites



1 reference

```
public class PersonService
```

```
{
```

```
    private readonly IPersonRepository _personRepository;
```

```
    private readonly IAdminRepository _adminRepository;
```

```
    private readonly IRoleRepository _roleRepository;
```

```
    private readonly IRoleMapper _roleMapper;
```

```
    private readonly IUserManager _userManager;
```

0 references | 0 exceptions

```
public PersonService(IPersonRepository personRepository,
```

```
    IAdminRepository adminRepository,
```

```
    IRoleRepository roleRepository,
```

```
    IRoleMapper roleMapper,
```

```
    IUserManager userManager)
```

```
{
```

```
    _personRepository = personRepository;
```

```
    _adminRepository = adminRepository;
```

```
    _roleRepository = roleRepository;
```

```
    _roleMapper = roleMapper;
```

```
    _userManager = userManager;
```

```
}
```

Cohesion - the degree to which the elements inside a module belong together

Modules with **high cohesion** tend to be preferable, because high cohesion is associated with several desirable traits of software including robustness, reliability, reusability, and **understandability**

Wikipedia

Coupling is the degree of interdependence between software modules; a measure of how closely connected two routines or modules are.

Wikipedia

All Users

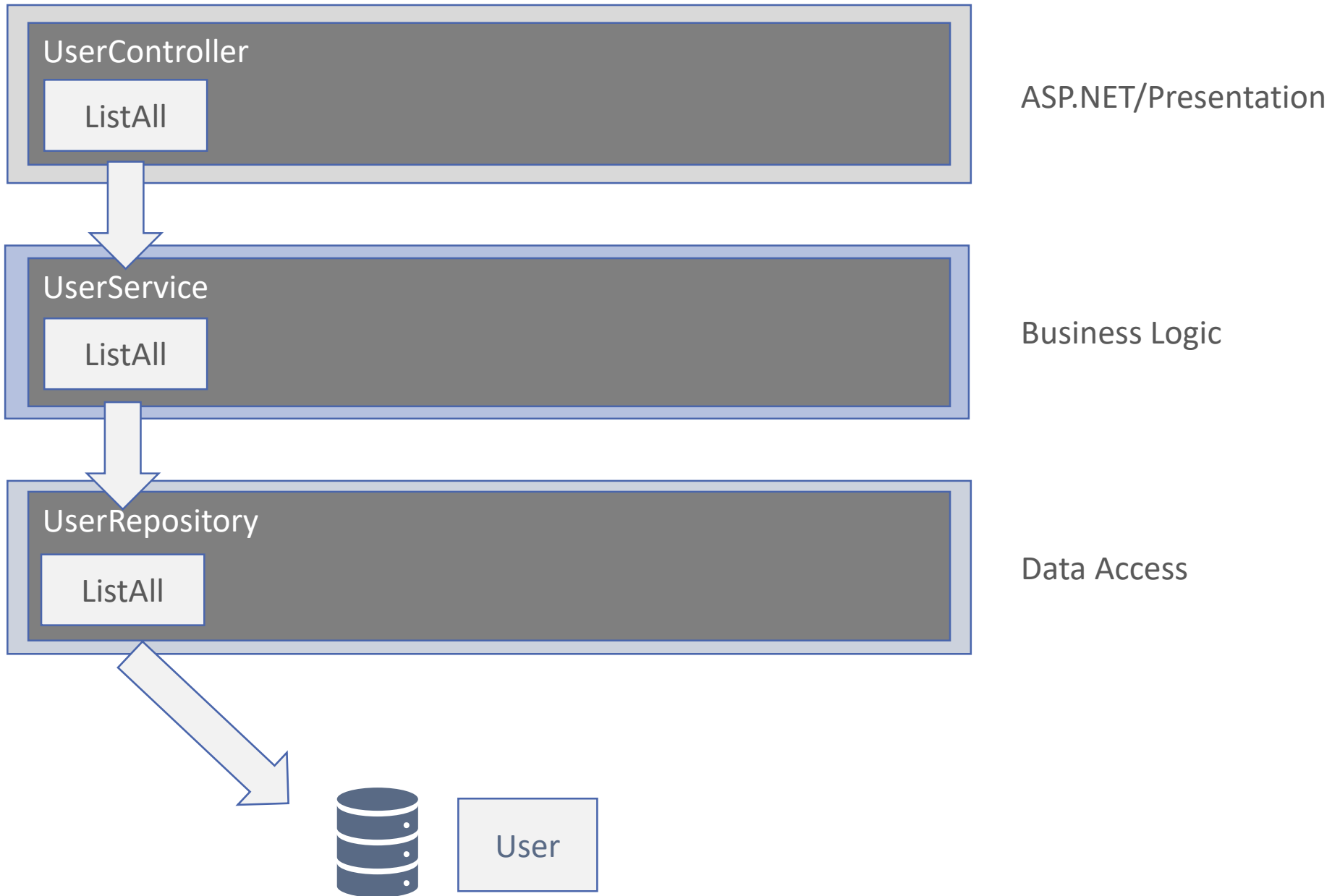
First Name	Last Name	Last Login	Active
Bob	Smith	01/02/2018	☒
James	Barrow	03/01/2019	☐
Janet	Jones	03/02/2018	☐
Ollie	Norburn	01/01/2018	☒
Jane	Tomley	05/01/ 200	☒

2018



ASP.NET/Presentation

?



E...    

▸ .vs

▸ .vscode

▾ Layers

▸ bin

▸ Controllers

▸ Models

▸ obj

▸ Properties

▸ Repositories

▸ Services

▸ Views

▸ wwwroot

{ } appsettings.Develop...

{ } appsettings.json

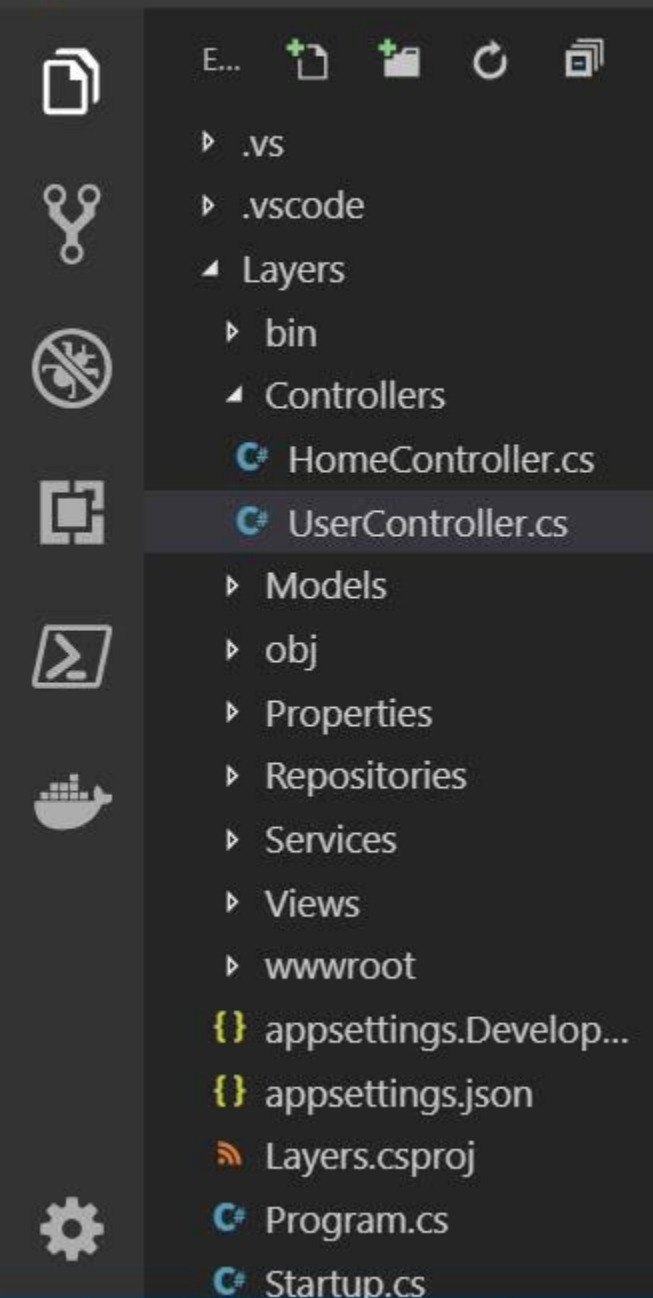
Layers.csproj

Program.cs

Startup.cs

≡ Layers.sln





```

1  using Microsoft.AspNetCore.Mvc;
2
3
4
5  namespace Layers
6  {
7      public class UserController : Controller
8      {
9          private readonly IUserService userService;
10
11         public UserController(IUserService userService)
12         {
13             this.userService = userService;
14         }
15
16         public async Task<IActionResult> List()
17         {
18             var users = userService.ListAll();
19             return View(users);
20         }
21     }
22 }
23

```

E...      IUserService.cs ×  ...

Layers

▸ bin

▸ Controllers

C# HomeController.cs

C# UserController.cs

▸ Models

▸ obj

▸ Properties

▸ Repositories

▸ Services

C# IUserService.cs

▸ Views

▸ wwwroot

{ } appsettings.Develop...

{ } appsettings.json

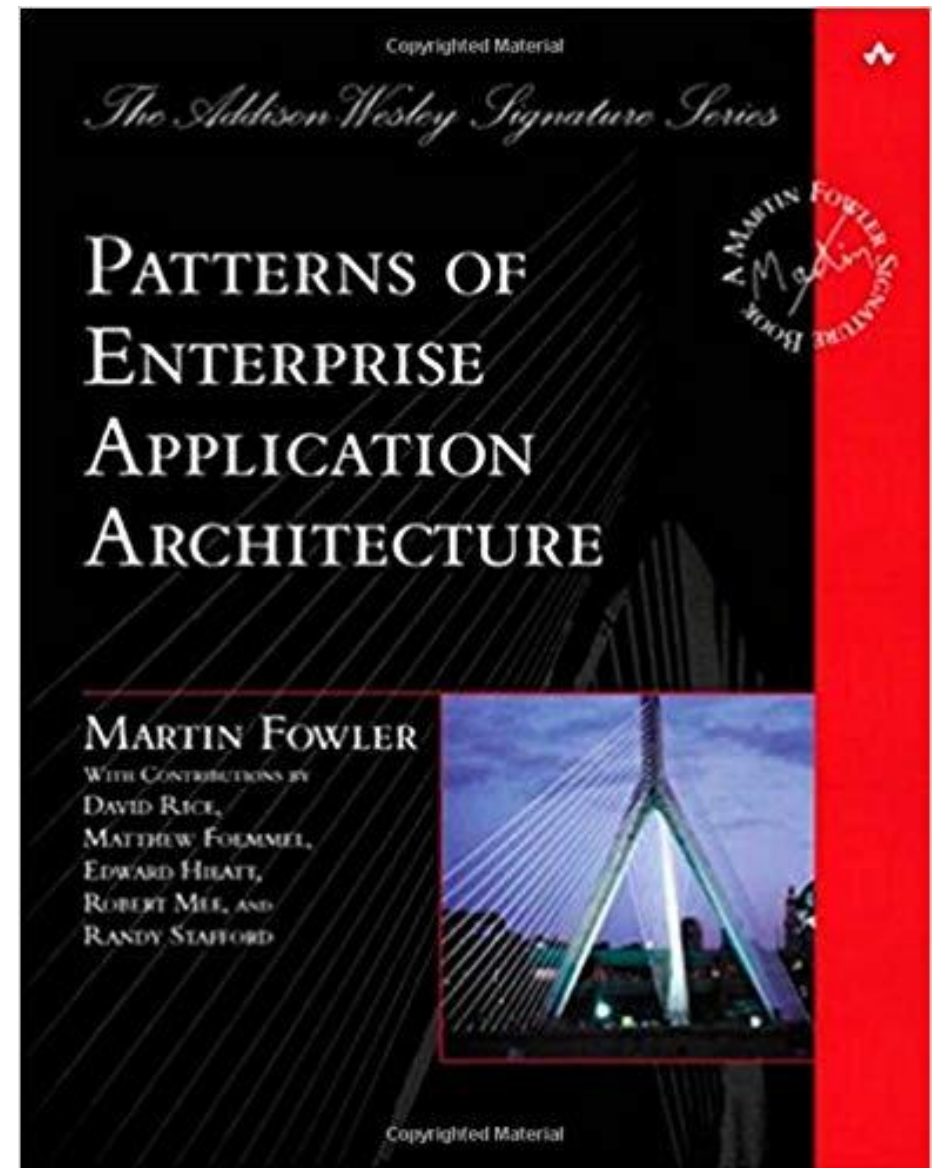
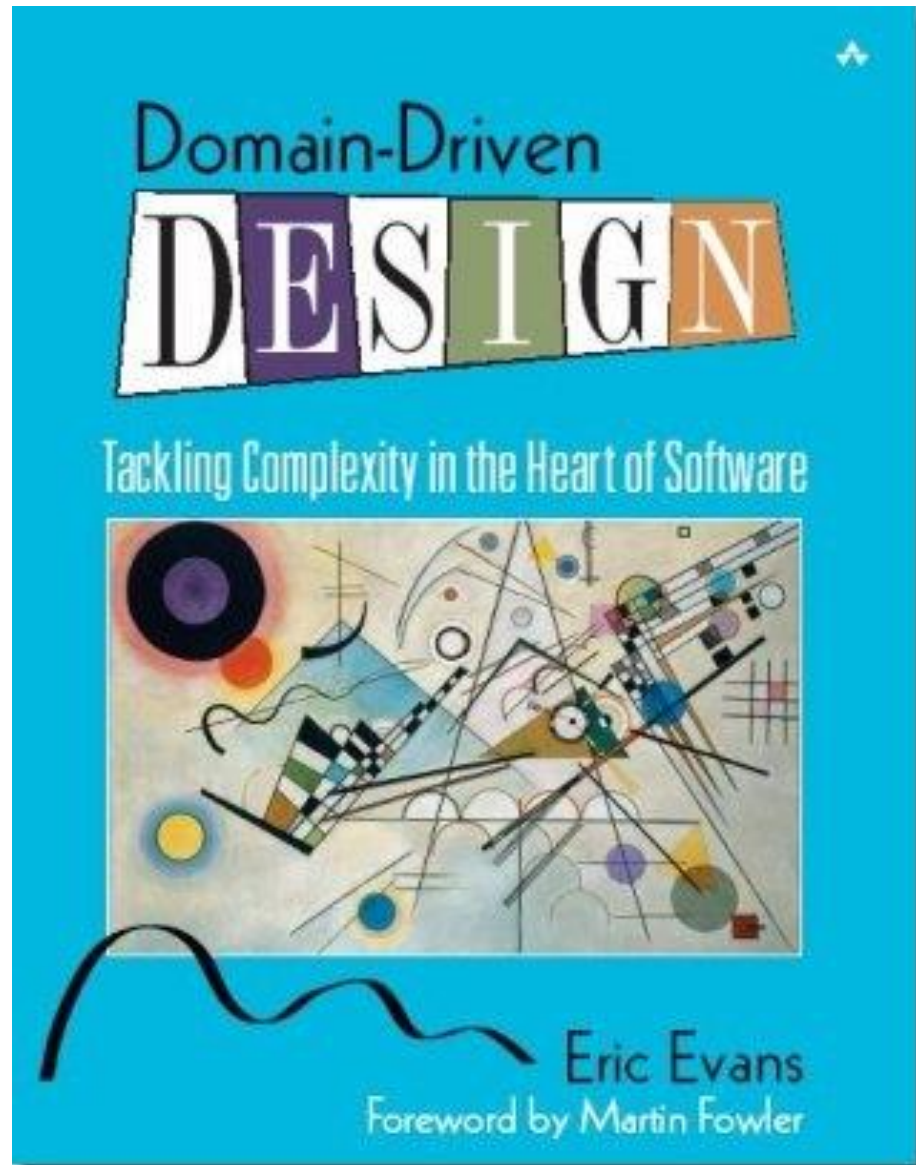
Layers.csproj

C# Program.cs

C# Startup.cs

Layers.sln

```
5 namespace Layers.Services
6 {
7     public interface IUserService
8     {
9         List<User> ListAll();
10    }
11
12    public class UserService : IUserService
13    {
14        private readonly IUserRepository userRepository;
15
16        public UserService(IUserRepository userRepository)
17        {
18            this.userRepository = userRepository;
19        }
20
21        public List<User> ListAll()
22        {
23            return userRepository.List();
24        }
25    }
26
```

"Conceptually, a Repository encapsulates the set of objects persisted in a **data store** and the operations performed over them, providing a more **object-oriented view** of the persistence layer. Repository also supports the objective of achieving a clean **separation** and one-way dependency between the domain and **data mapping** layers."

[Patterns of Enterprise Application Architecture](#) by Martin Fowler et al

"adding this layer helps **minimise duplicate query logic...**"

[Patterns of Enterprise Application Architecture](#) by Martin Fowler et al

User Search

First Name	Last Name	Last Login
Bob	Smith	01/02/2018
Bob	Bennet	03/01/2019
Bobina	Bobalot	03/02/2018
Bobby	Boat	01/01/2018



E...

▸ .vs
▸ .vscode▾ Layers
▸ bin
▾ Controllers

C# HomeController.cs

C# UserController.cs



▸ Models

▸ obj

▸ Properties

▸ Repositories

▸ Services

▸ Views

▸ wwwroot



{ } appsettings.Develop...

{ } appsettings.json

Layers.csproj



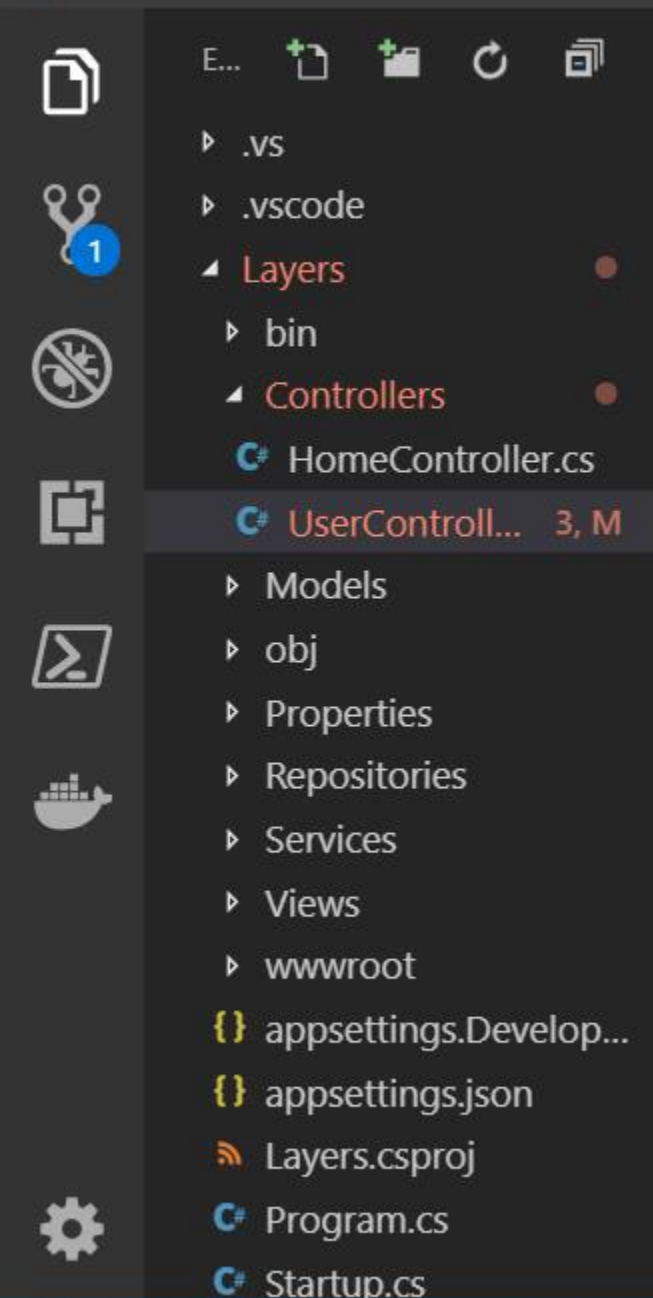
C# Program.cs

C# Startup.cs

UserController.cs ✕

```
4  
5 namespace Layers  
6 {  
7     public class UserController : Controller  
8     {  
9         private readonly IUserService userService;  
10  
11         public UserController(IUserService userService)  
12         {  
13             this.userService = userService;  
14         }  
15  
16         public async Task<IActionResult> List()  
17         {  
18             var users = userService.ListAll();  
19             return View(users);  
20         }  
21  
22     }  
23 }
```

...



```

11 public UserController(IUserService userService)
12 {
13     this.userService = userService;
14 }
15
16 public async Task<IActionResult> List()
17 {
18     var users = userService.ListAll();
19     return View(users);
20 }
21
22 public async Task<IActionResult> Search(string searchTerm){
23     var result = userService.Search(searchTerm);
24     return View(result);
25 }
26
27 }
28 }
    
```

A lightbulb icon is visible next to line 23, indicating a suggestion. A tooltip box is open, showing the text: "Generate method 'IUserService.Search'" with a cursor pointing to the word "Generate".



1

2

E...

+

+

↺

📄

UserController.cs

IUserService.cs x

IUserRepository.cs ●

Layers

bin

Controllers

HomeController.cs

UserControll... 2, M

Models

obj

Properties

Repositories

Services

IUserService.cs 1, M

Views

wwwroot

appsettings.Develop...

appsettings.json

Layers.csproj

Program.cs

Startup.cs

Layers.sln

13

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32

33

```

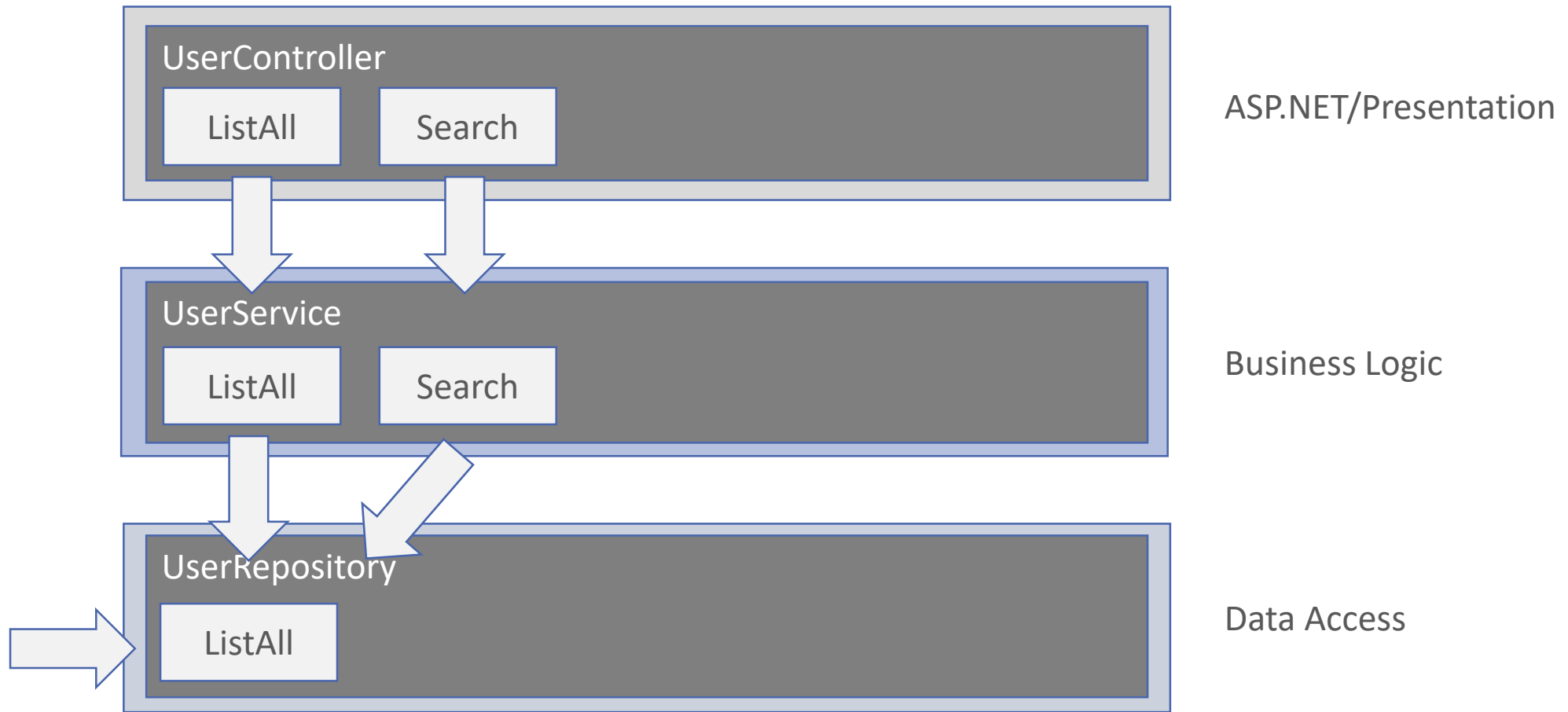
public class UserService : IUserService
{
    private readonly IUserRepository userRepository;

    public UserService(IUserRepository userRepository)
    {
        this.userRepository = userRepository;
    }

    public List<User> ListAll()
    {
        return userRepository.List();
    }

    public List<User> Search(string searchTerm)
    {
        return userRepository.List(searchTerm);
    }
}

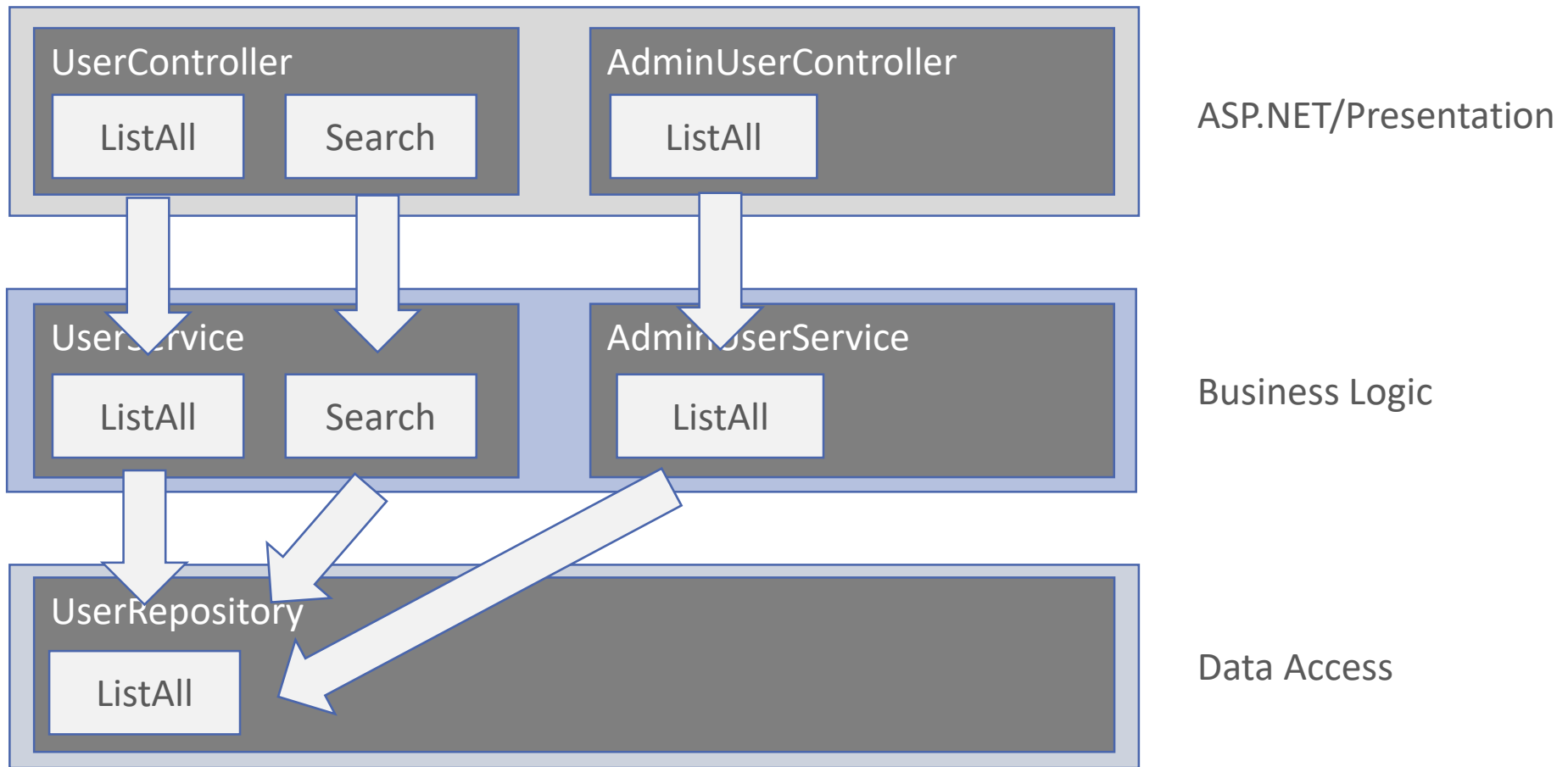
```

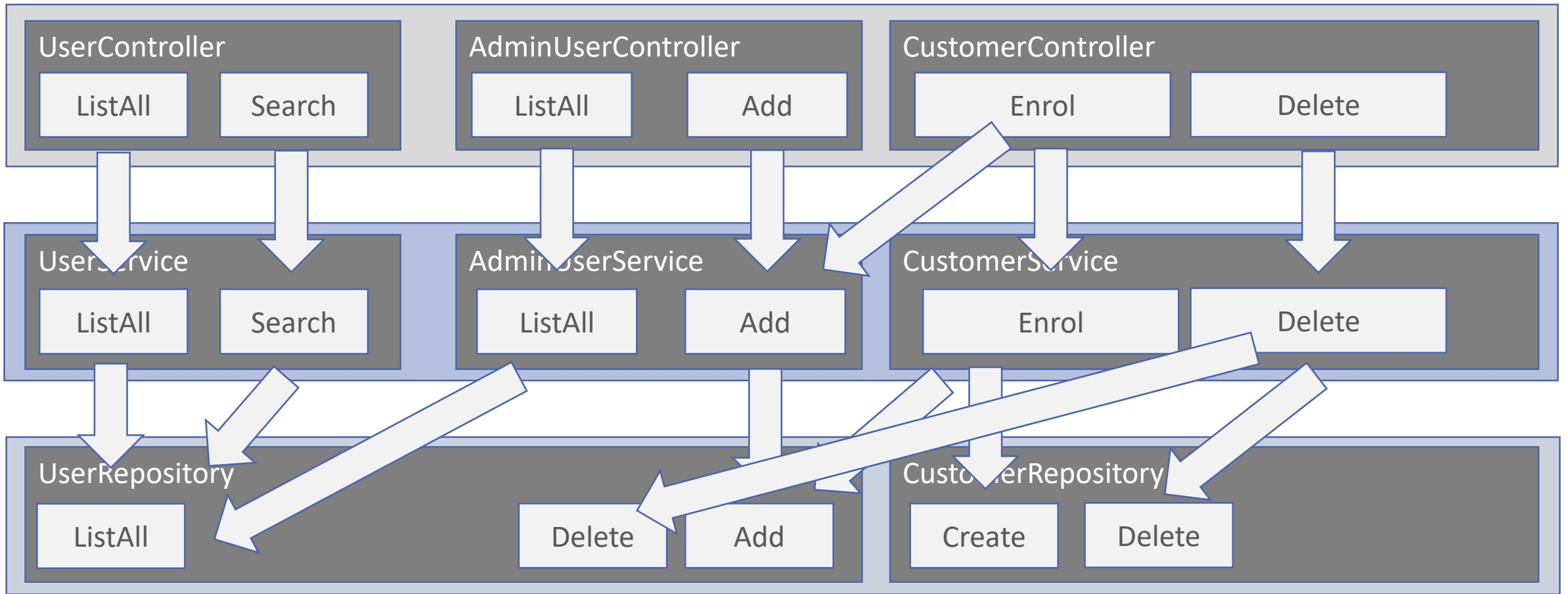


All Users



First Name	Last Name	Last Login	Roles
Bob	Smith	01/02/2018	Admin
Bob	Bennet	03/01/2019	Super User
Bobina	Bobalot	03/02/2018	User
Bobby	Boat	01/01/2018	User





Helpers	Mappers	Managers
Factories	ServiceFactories	Functions
Requests	Responses	Models
ViewModels	DALs	Readers
Repositories		ReadOnlyRepositories





Search Twitter

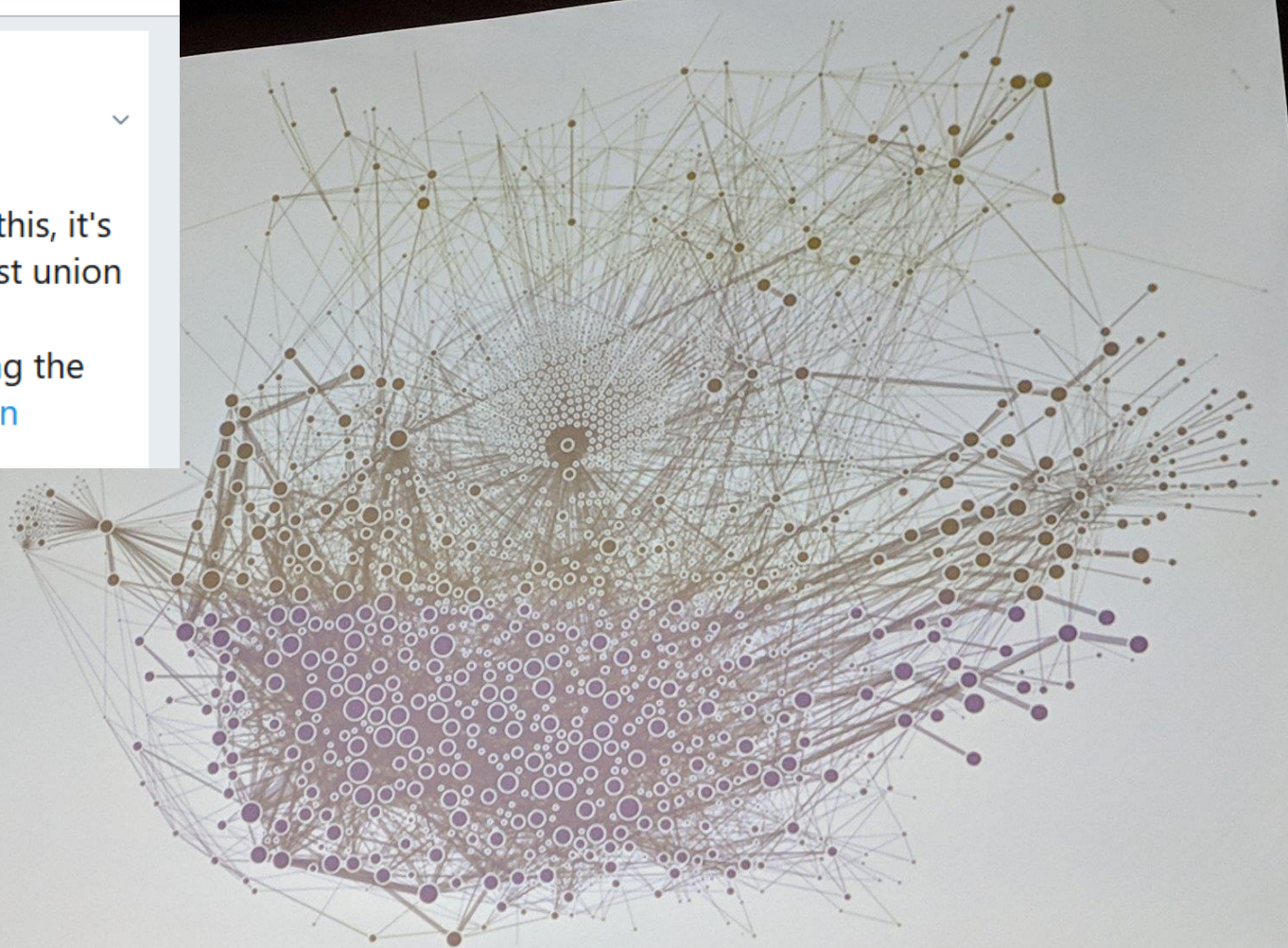
♥ Bernard Vander Beken liked

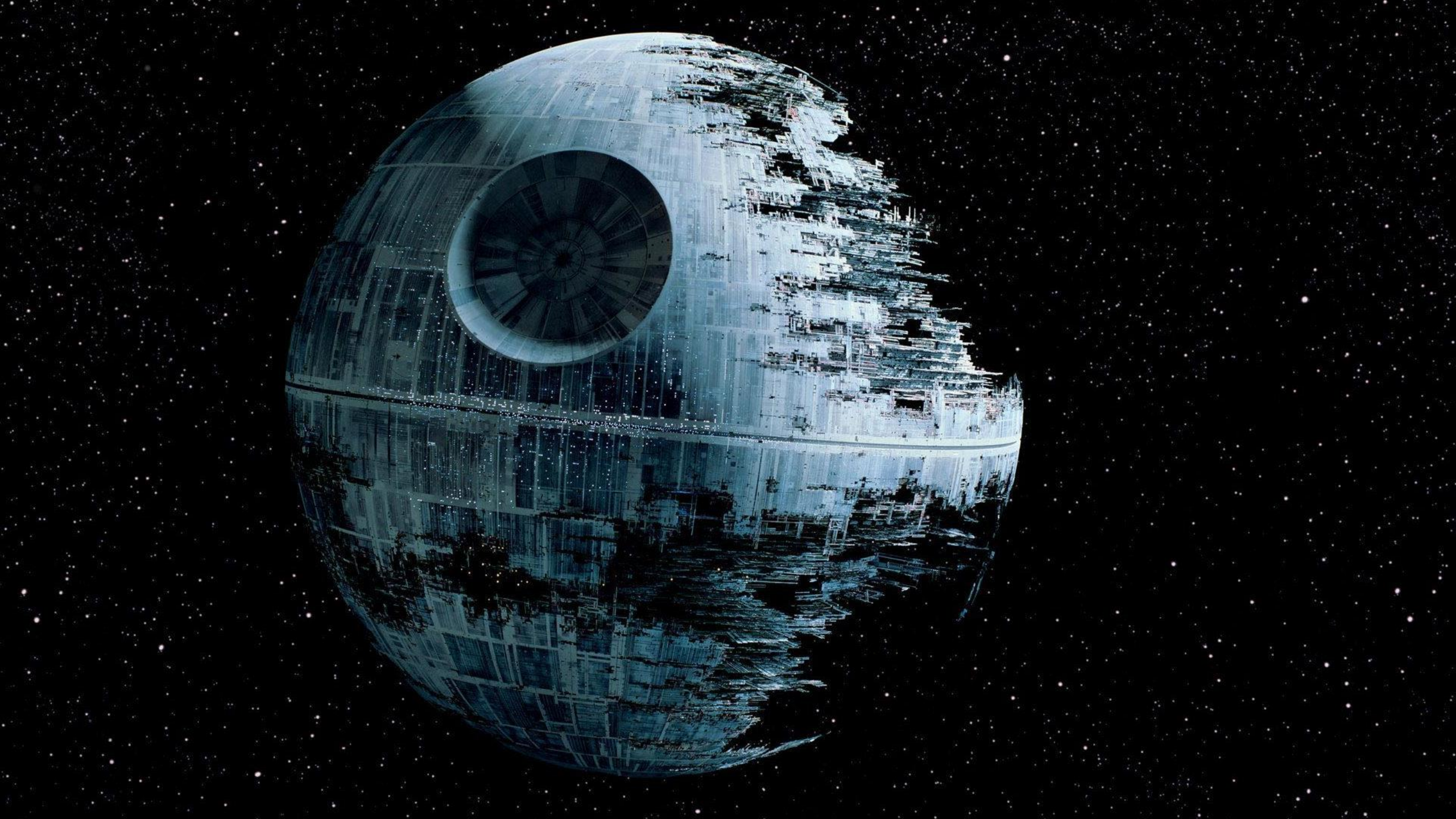


Marc von Renteln
@mvonrenteln



When your Micro Service Architecture looks like this, it's split the wrong way. This is a [#microlith](#): The worst union of Microservices and a big ball of mud. A lot of accidental complexity. You should invest in finding the proper boundaries. [#boundedContext](#) [#DDDDesign](#)





What if we focus on features?

All Users

First Name	Last Name	Last Login	Active
Bob	Smith	01/02/2018	☒
James	Barrow	03/01/2019	☐
Janet	Jones	03/02/2018	☐
Ollie	Norburn	01/01/2018	☒
Jane	Tomley	05/01/ 200	☒

2018

E...    

▸ .vscode

▸ bin

▸ **Features** ●

▸ Migrations

▸ Models

▸ obj

▸ Properties

▸ wwwroot

▸ .gitignore

{ } appsettings.Developm...

{ } appsettings.json

Friction.WebVS.csproj

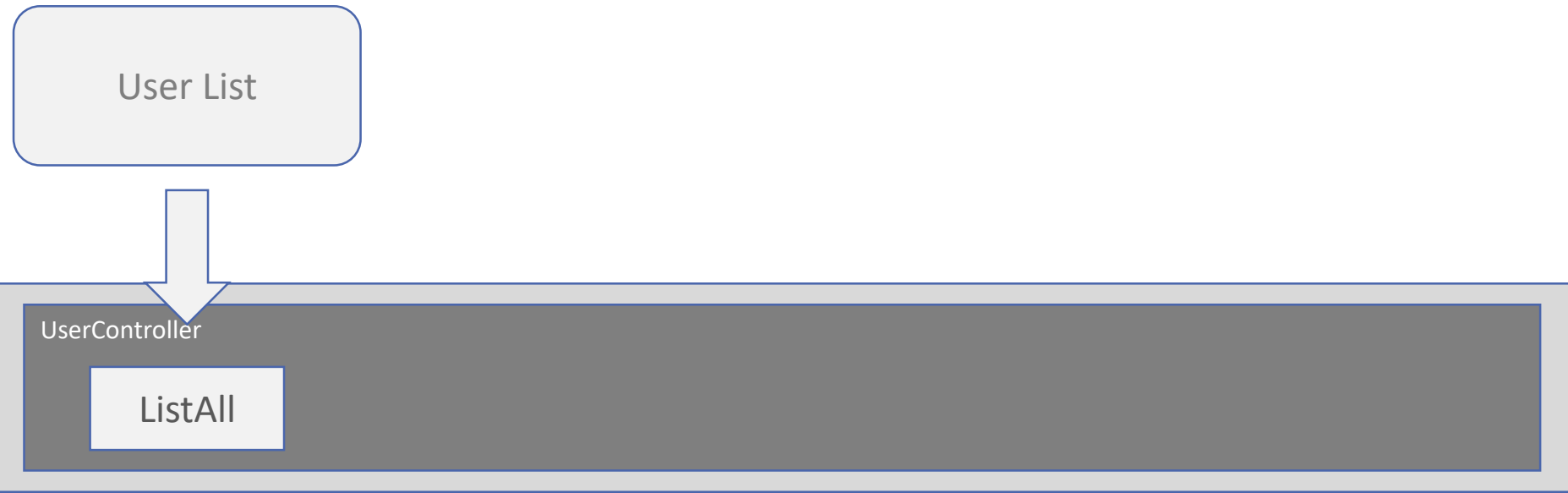
Friction.WebVS.sln

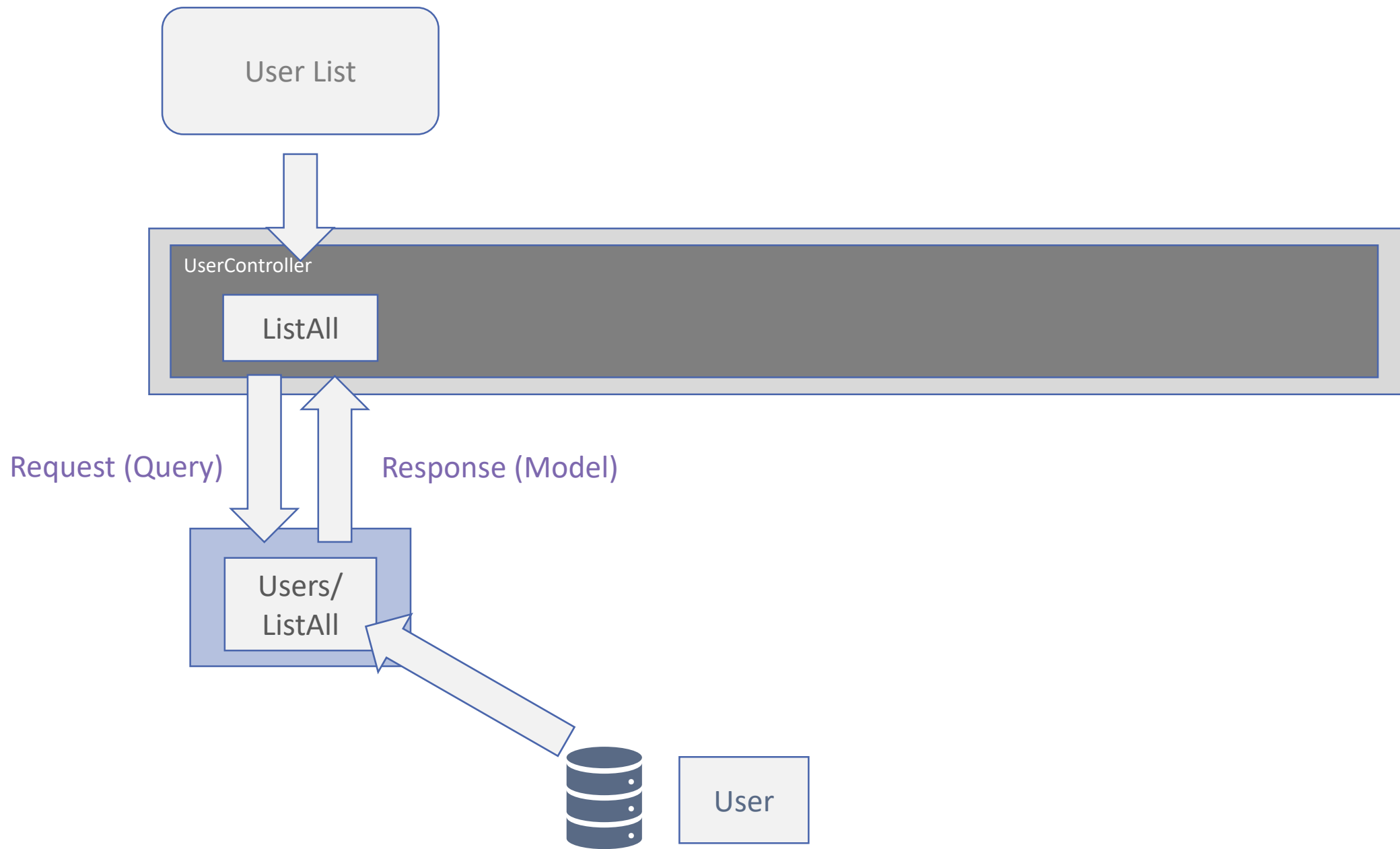
C# Program.cs

i README.md

C# Startup.cs









E...

▸ .vscode

▸ bin

▾ Features

▸ Home

▸ Shared

▾ Users

List.cs

List.cshtml

UserController.cs M

_ViewImports.cshtml

_ViewStart.cshtml

▸ Migrations

▸ Models

▸ obj

▸ Properties

▸ wwwroot

.gitignore

{ } appsettings.Developm...

{ } appsettings.json

D:\Code\Talks\layers - with slices\Features\Users\List.cshtml



E...

- .vscode
- bin
- ▾ Features
 - Home
 - Shared
- ▾ Users
 - ☕ List.cs
 - ☰ List.cshtml
 - ☕ UserController.cs M
 - ☰ _ViewImports.cshtml
 - ☰ _ViewStart.cshtml
- Migrations
- Models
- obj
- Properties
- wwwroot
- ◆ .gitignore
- {} appsettings.Developm...
- {} appsettings.json

UserController.cs ×

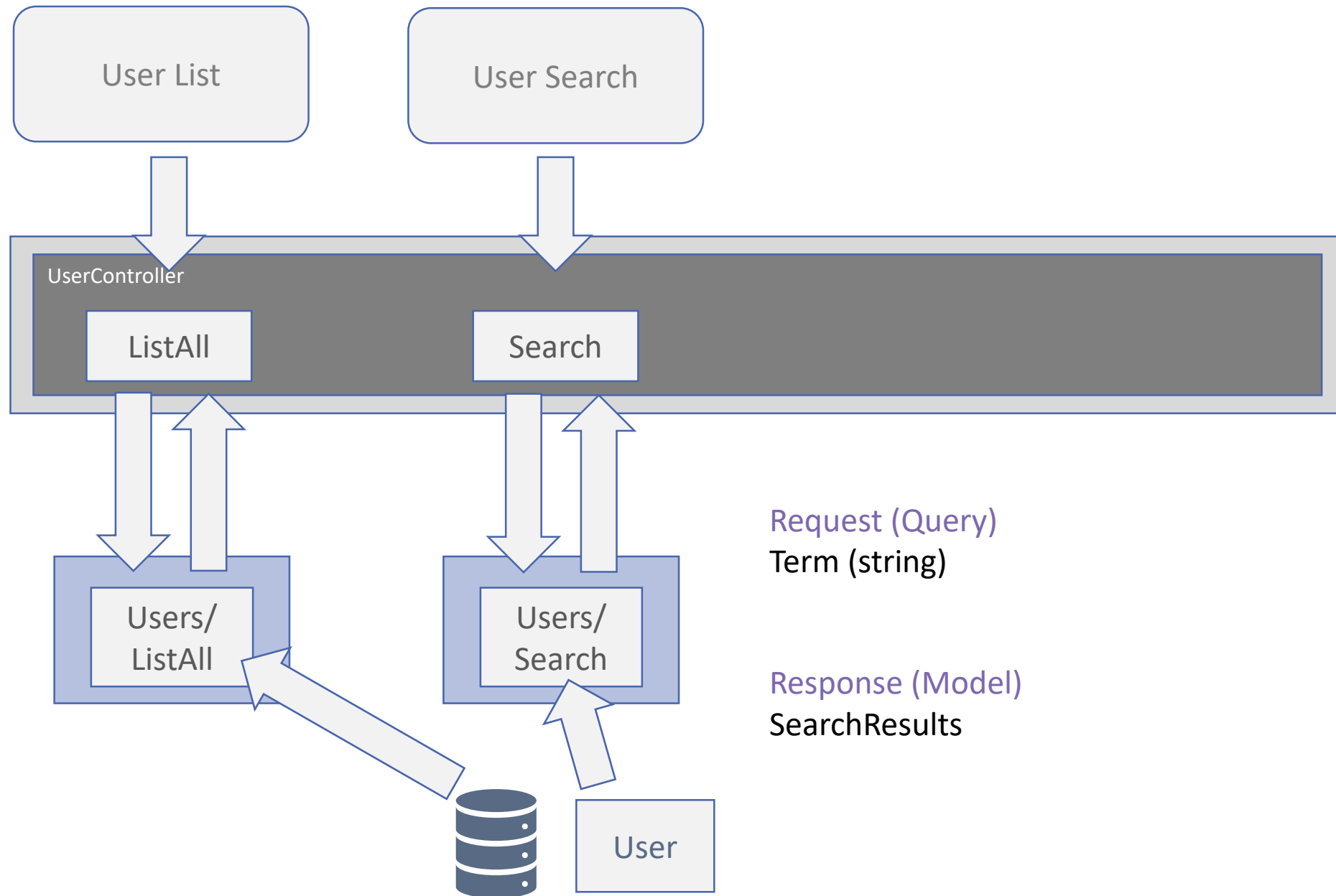
```

6      {
7          public class UserController : Controller
8          {
9              private readonly IMediator mediator;
10
11              public UserController(IMediator mediator)
12              {
13                  this.mediator = mediator;
14              }
15
16              [HttpGet]
17              public async Task<IActionResult> List()
18              {
19                  var result = await mediator.Send(new List.Query());
20                  return View(result);
21              }
22          }
23      }
    
```


User Search

4 users found...

First Name	Last Name	Last Login
Bob	Smith	01/02/2018
Bob	Bennet	03/01/2019
Bobina	Bobalot	03/02/2018
Bobby	Boat	01/01/2018



Request (Query)
Term (string)

Response (Model)
SearchResults



E...

▸ .vscode

▸ bin

▾ Features

▸ Home

▸ Shared

▾ Users

C# List.cs

≡ List.cshtml

C# Search.cs

≡ Search.cshtml

C# UserController.cs M

≡ _ViewImports.cshtml

≡ _ViewStart.cshtml

▸ Migrations

▸ Models

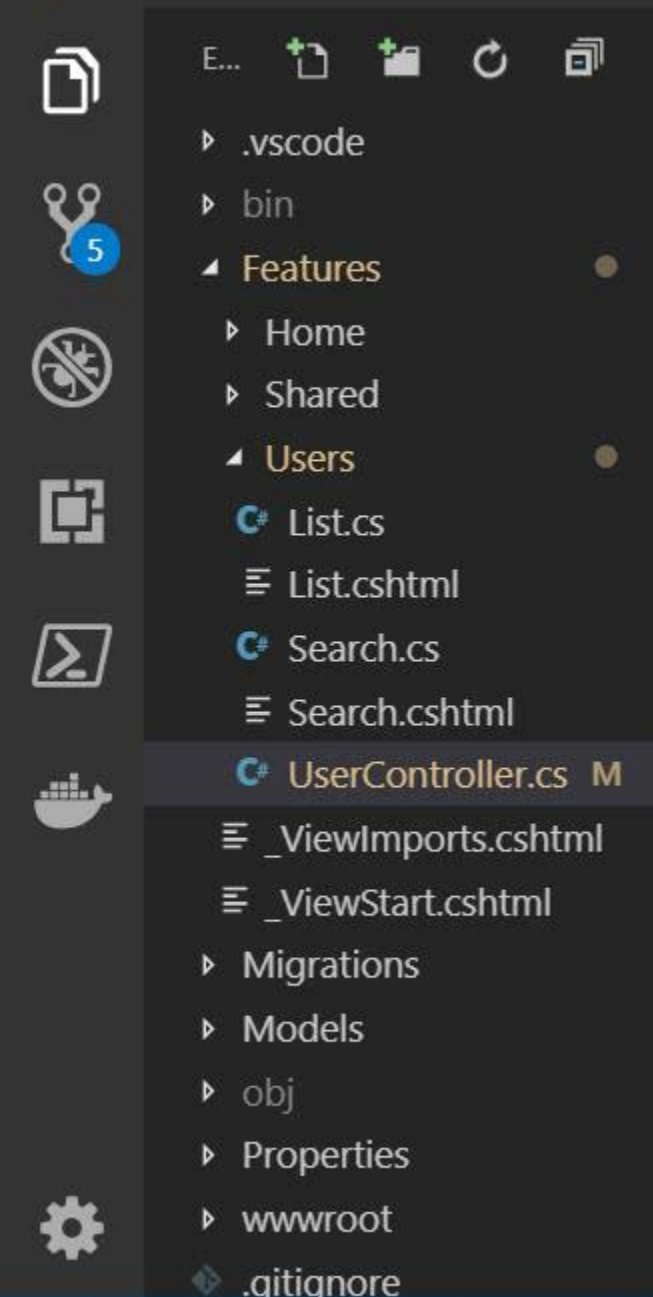
▸ obj

▸ Properties

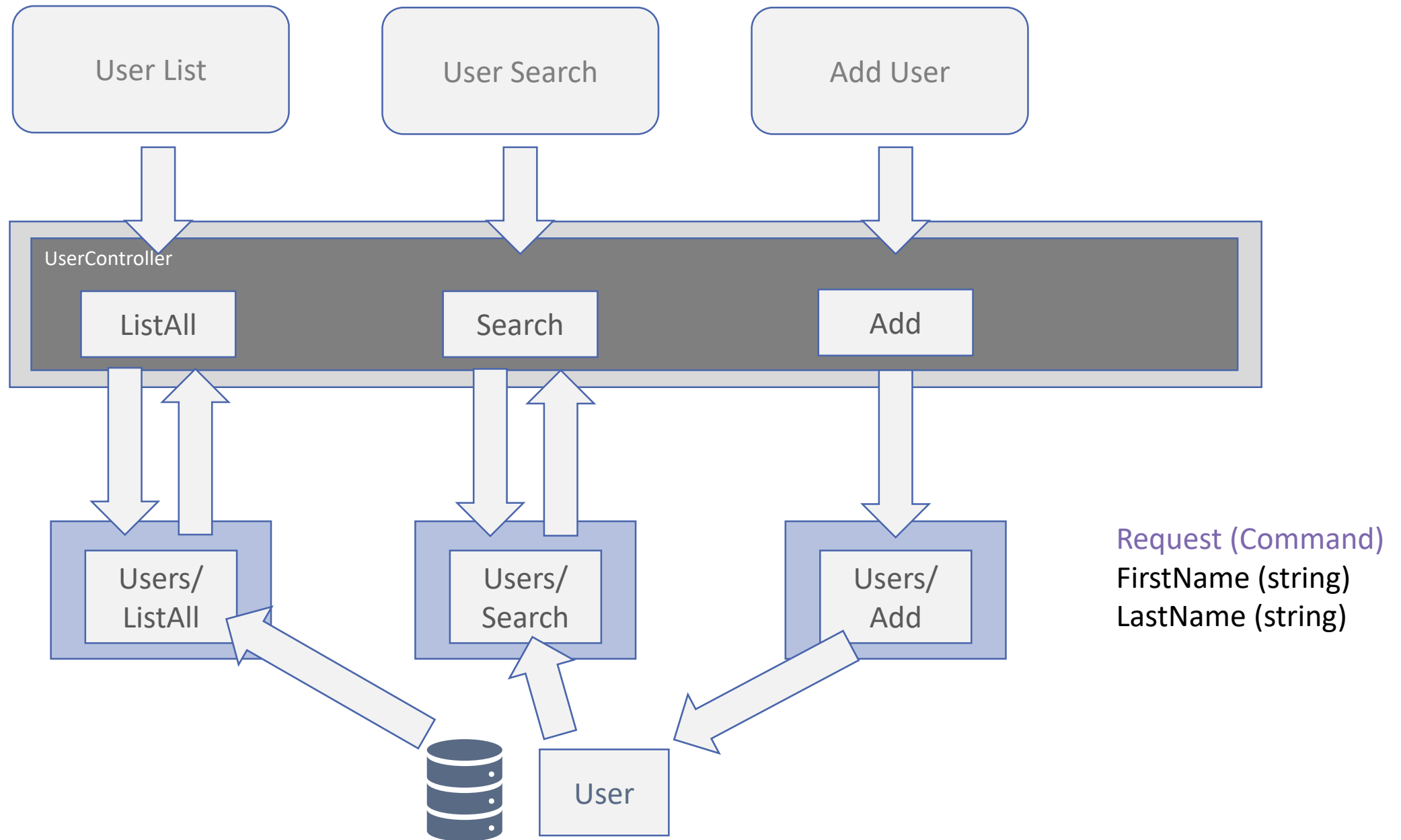
▸ wwwroot

.gitignore





```
UserController.cs x
10
11 public UserController(IMediator mediator)
12 {
13     this.mediator = mediator;
14 }
15
16 [HttpGet]
17 public async Task<IActionResult> List()
18 {
19     var result = await mediator.Send(new List.Query());
20     return View(result);
21 }
22
23 [HttpGet]
24 public async Task<IActionResult> Search(Search.Query query)
25 {
26     var result = await mediator.Send(query);
27     return View(result);
28 }
29 }
30 }
```



E...    

- .vscode
- bin
- ▾ Features
 - Home
 - Shared
- ▾ Users
 -  Add.cs
 - ≡ Add.cshtml
 -  List.cs
 - ≡ List.cshtml
 -  Search.cs
 - ≡ Search.cshtml
 -  **UserControlle... 1, M**
 - ≡ _ViewImports.cshtml
 - ≡ _ViewStart.cshtml
- Migrations
- Models
- obj
- Properties

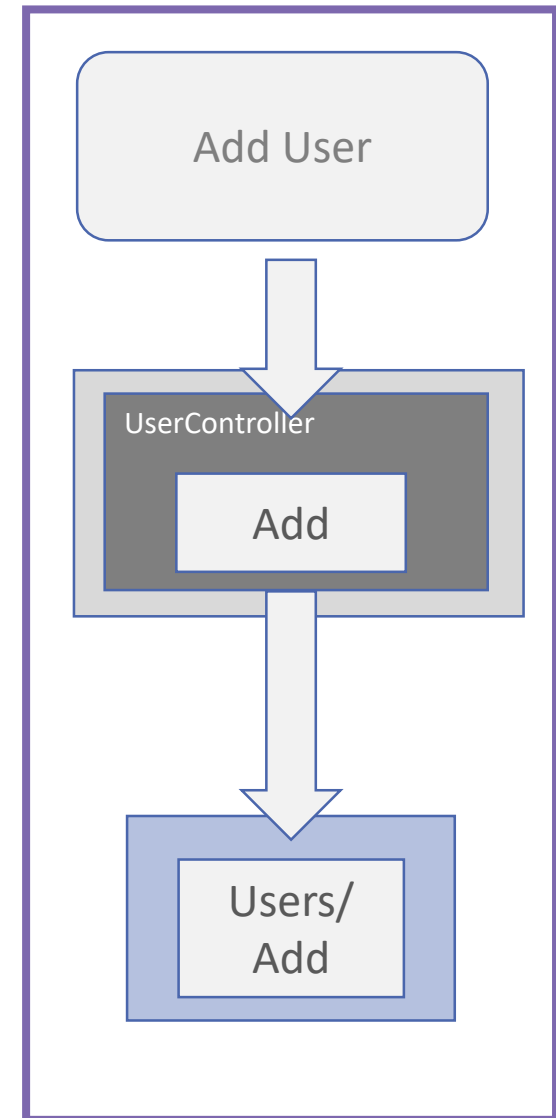
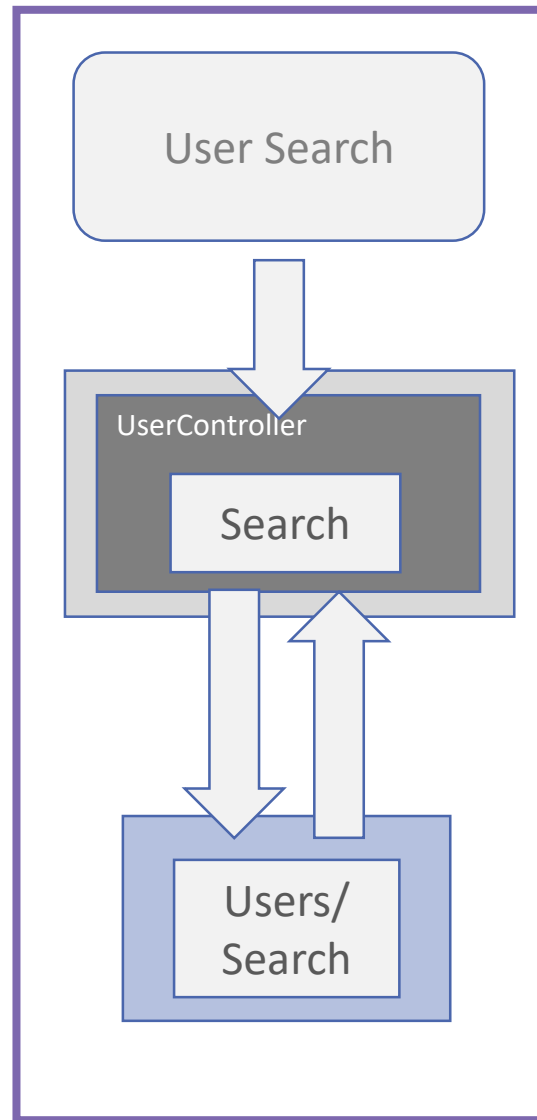
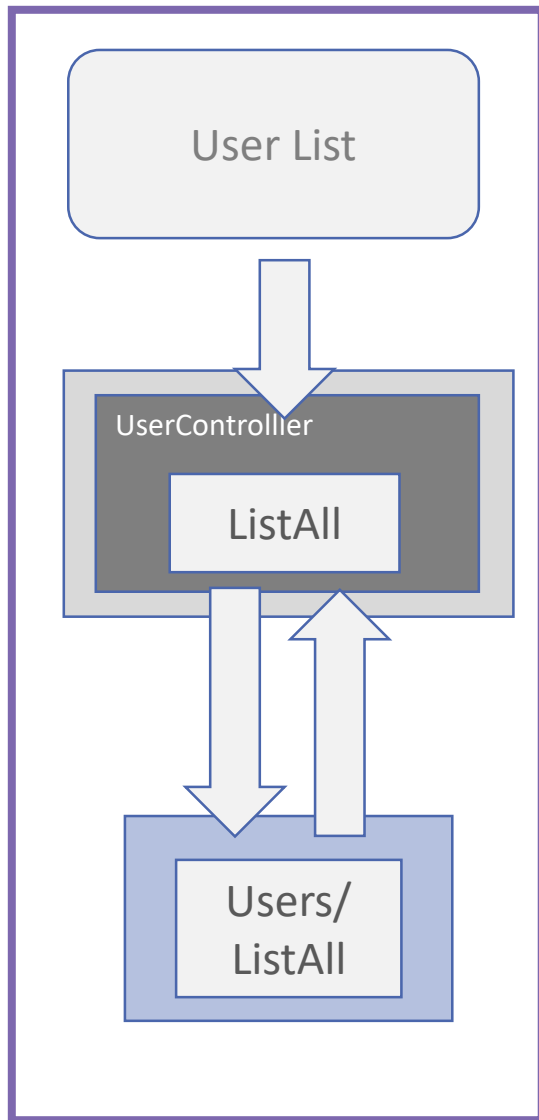
UserController.cs ×

```
11 public UserController(IMediator mediator)
12 {
13     this.mediator = mediator;
14 }
15
16 [HttpGet]
17 public async Task<IActionResult> Add()
18 {
19     return View();
20 }
21
22 [HttpPost]
23 public async Task<IActionResult> Add(Add.Command command)
24 {
25     await mediator.Send(command);
26     return RedirectToAction(nameof(Add));
27 }
28
29 [HttpGet]
30 public async Task<IActionResult> List()
31 {
32     var result = await mediator.Send(new List.Query());
```




```
var result = await mediator.Send(new List.Query());
```

Encapsulate by feature



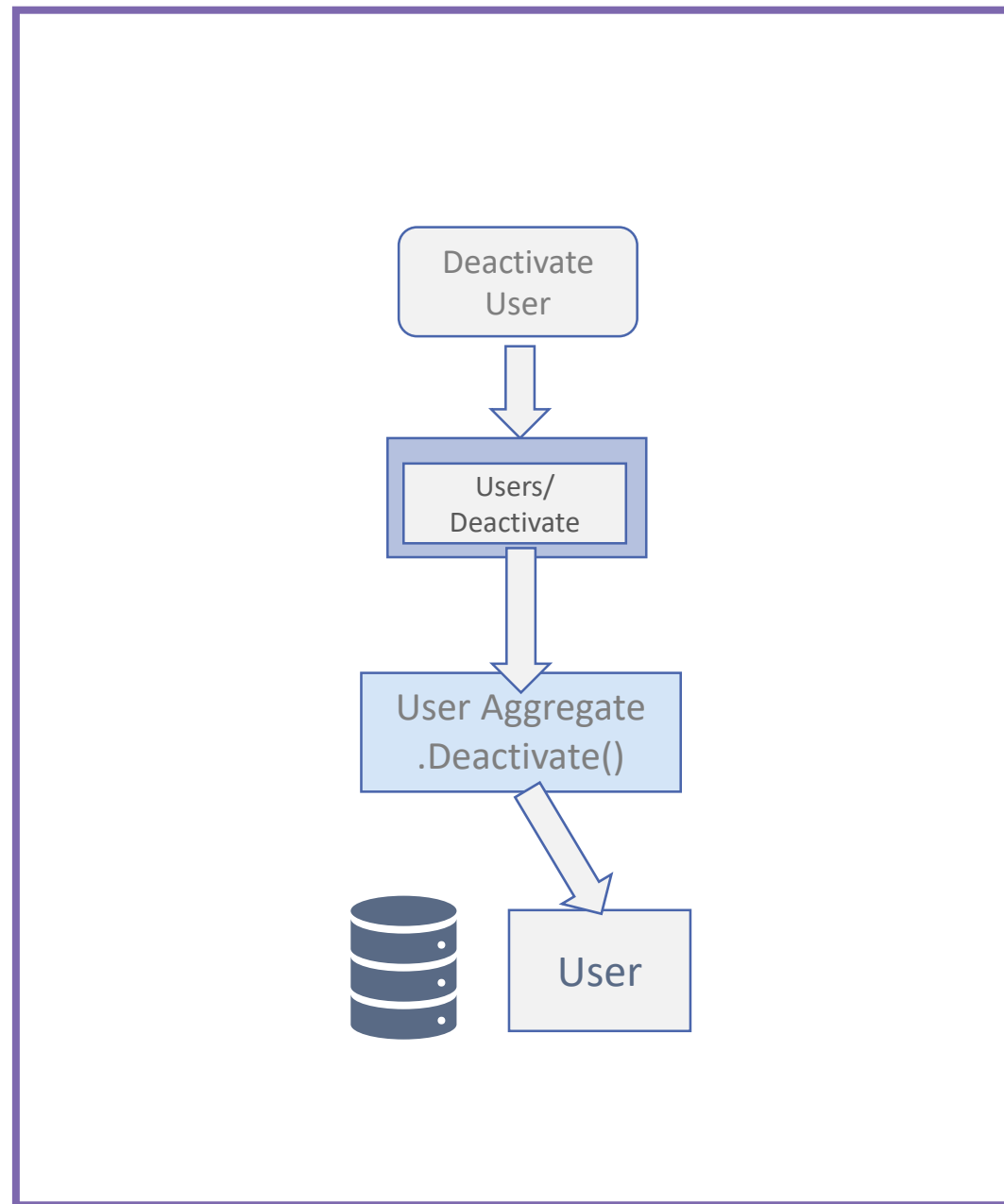
Developer



Success!



Refactor by feature



UpdateTaskDescription.cs ×



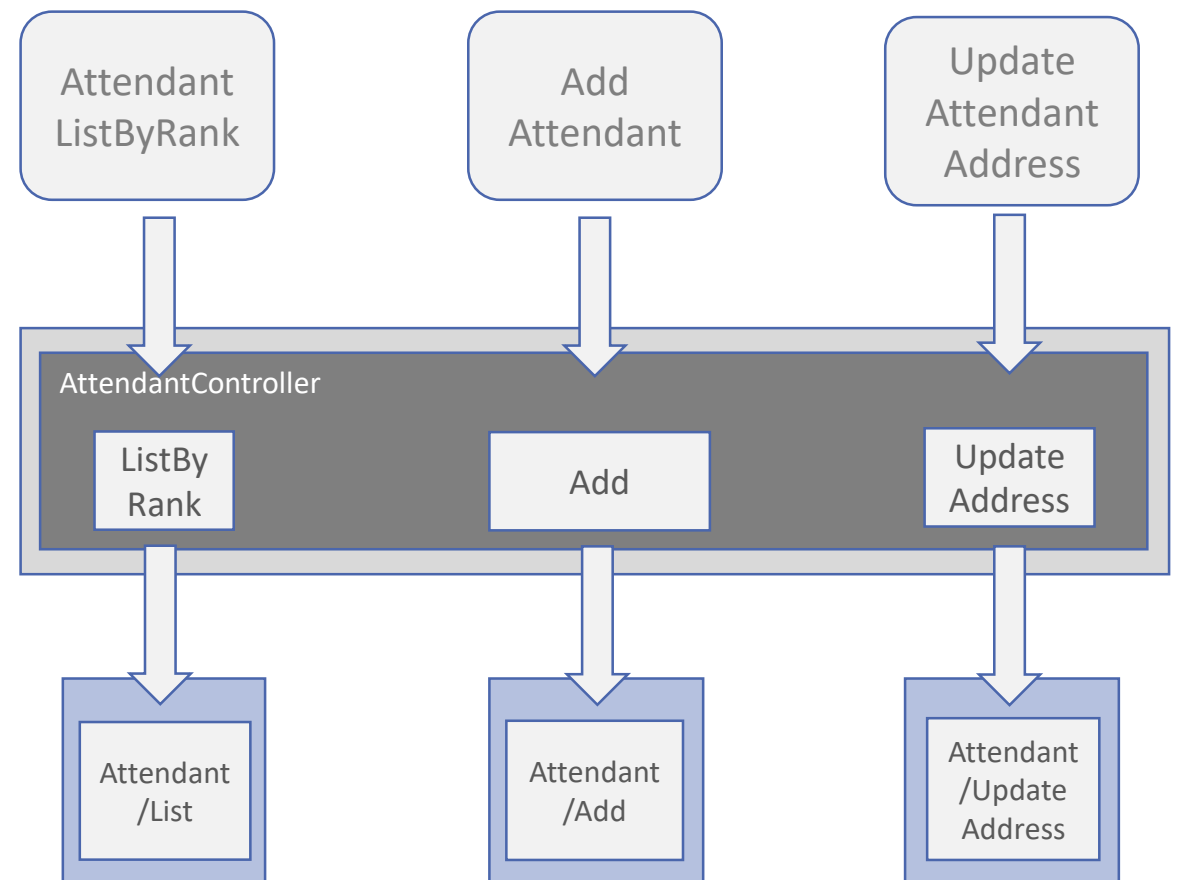
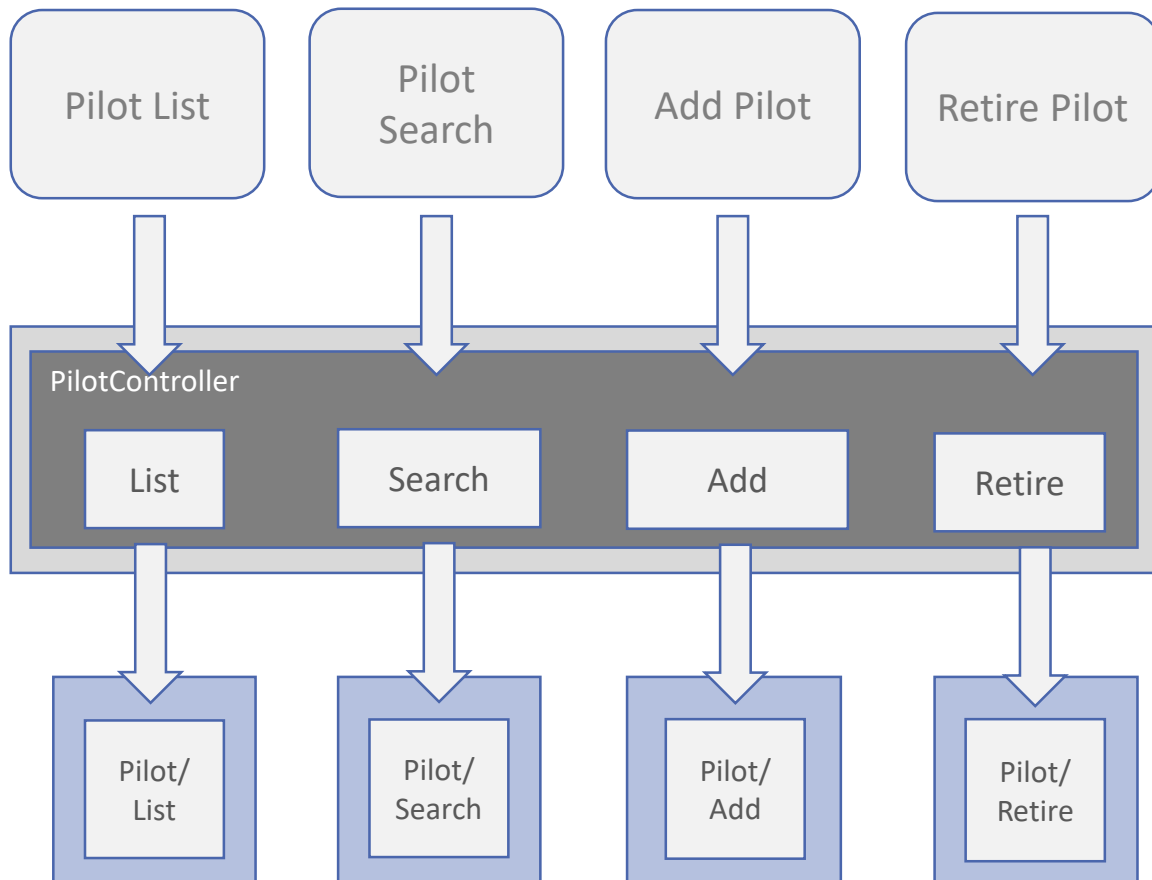
```
9
10 namespace Stroke_Active.WebAPI.Features.HCP.Programme
11 {
12     public class UpdateTaskDescription
13     {
14         public class Command : AuthenticatedRequest<CommandResult>
15         {
16             public string Description { get; set; }
17             public Guid PatientId { get; set; }
18             public Guid TaskId { get; set; }
19         }
20
21         public class CommandHandler : IRequestHandler<Command, CommandResult>
22         {
23             private readonly IRehabProgrammeRepository _rehabProgrammeRepository;
24             private readonly StrokeActiveContext _context;
25
26             public CommandHandler(IRehabProgrammeRepository programmeRepository, StrokeActiveContext context)
27             {
28                 _context = context;
29                 _rehabProgrammeRepository = programmeRepository;
30             }
31
32             public async Task<CommandResult> Handle(Command request, CancellationToken cancellationToken)
33             {
34                 var professionalId = await _context.HealthCareProfessionals
35                     .Where(x => x.Identifier == request.Identifier)
36                     .Select(x=>x.Id)
37                     .SingleOrDefaultAsync(cancellationToken);
38
```

UpdateTaskDescription.cs ×

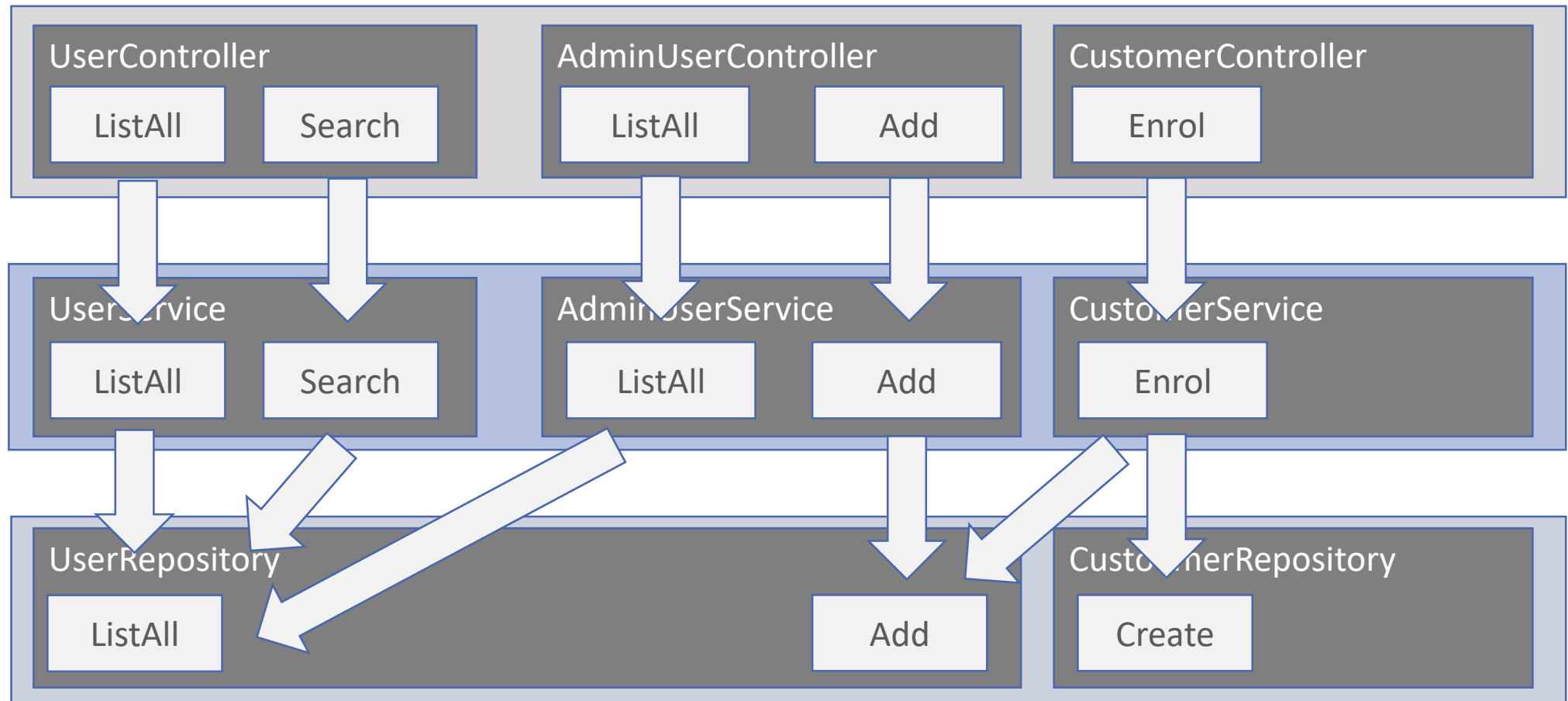


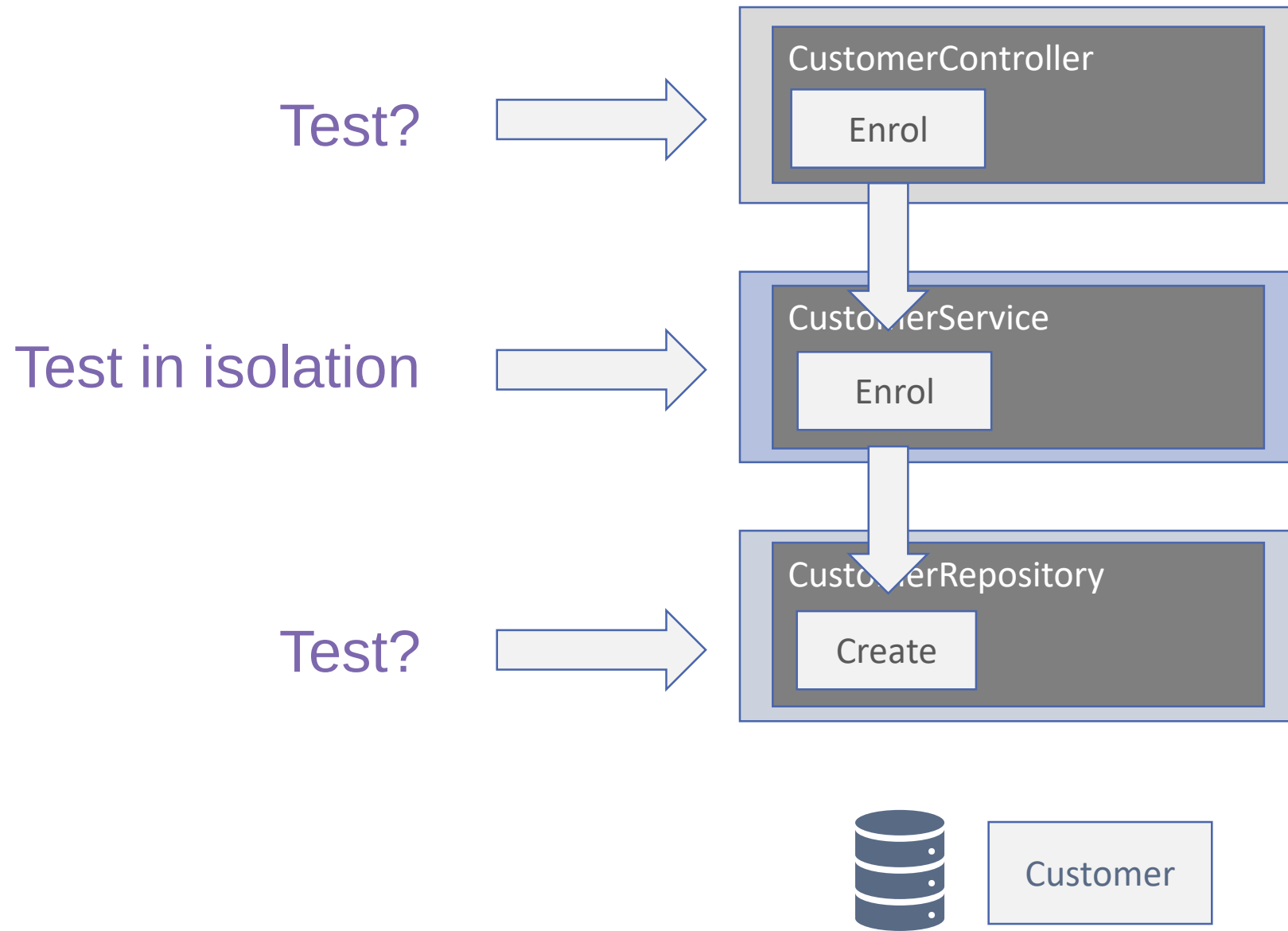
```
20
21 public class CommandHandler : IRequestHandler<Command, CommandResult>
22 {
23     private readonly IRehabProgrammeRepository _rehabProgrammeRepository;
24     private readonly StrokeActiveContext _context;
25
26     public CommandHandler(IRehabProgrammeRepository programmeRepository, StrokeActiveContext context)
27     {
28         _context = context;
29         _rehabProgrammeRepository = programmeRepository;
30     }
31
32     public async Task<CommandResult> Handle(Command request, CancellationToken cancellationToken)
33     {
34         var professionalId = await _context.HealthCareProfessionals
35             .Where(x => x.Identifier == request.Identifier)
36             .Select(x=>x.Id)
37             .SingleOrDefaultAsync(cancellationToken);
38
39         var programme = await _rehabProgrammeRepository.ForPatient(request.PatientId);
40         if (programme == null)
41             return CommandResult.WithError("Could not find programme for patient");
42
43         programme.ChangeTaskDescription(request.TaskId, request.Description, professionalId);
44
45         return CommandResult.Success();
46     }
47 }
48
49 }
```

Avoid links between features
(specific, business logic)



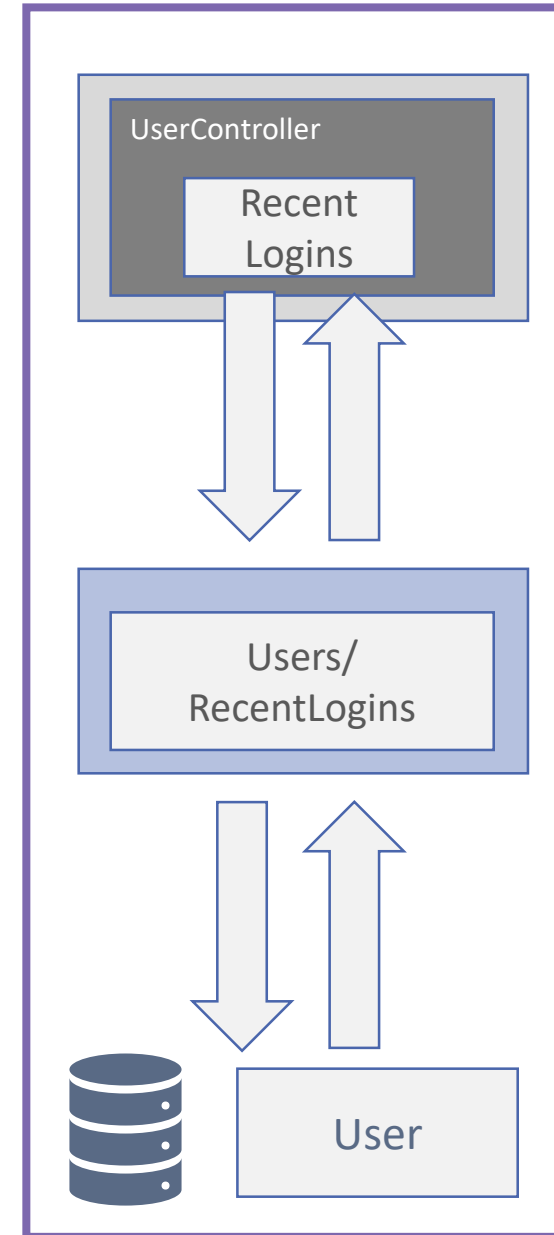
What about tests?





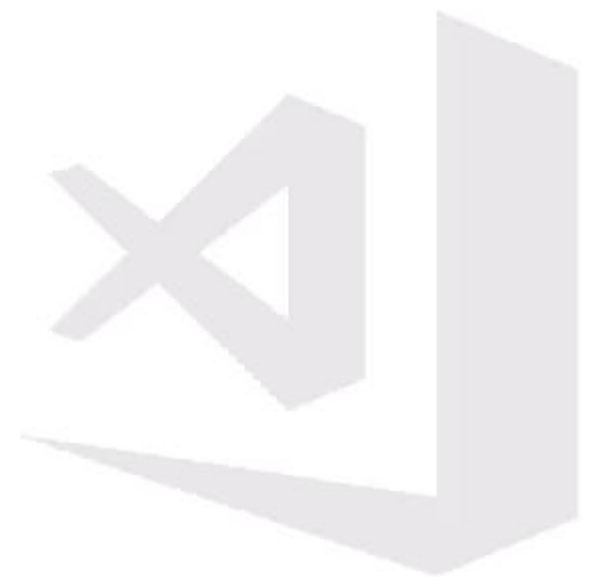
When viewing the most recent user logins

I should see the last x users who logged in (in descending order by their last login date/time)



The names used are those of
the business domain (feature)

- EXPLORER: FRICTIO...    
- .vs 2
 - ▾ Friction.Specs
 - bin
 - Features
 - obj
 -  appsettings.json
 -  Friction.Specs.csproj
 -  TestContext.cs
 - Friction.WebVS
 - ≡ Friction.Web.sln
 - ≡ Friction.Web.sln.DotSettings.user



- Show All Commands  +  + 
- Go to File  + 
- Find in Files  +  + 
- Start Debugging 
- Toggle Terminal  + 

RecentLogins.cs ×



```
3 using System.Threading.Tasks;
4 using Friction.WebVS.Features.Users;
5 using Friction.WebVS.Models;
6 using Shouldly;
7 using Xunit;
8
9 namespace Friction.Specs.Features.Users
10 {
11     public class RecentLogins : IntegrationTestBase
12     {
13         [Fact]
14         public async Task ShouldReturnTop2MostRecentlyActiveUsers()
15         {
16             var bob = new User { FirstName = "Bob", LastName = "Smith", LastLogin = new DateTime(2012, 1, 1), Id = Guid.NewGuid() };
17             var alice = new User { FirstName = "Alice", LastName = "Smith", LastLogin = new DateTime(2018, 2, 1), Id = Guid.NewGuid() };
18             var cooper = new User { FirstName = "Cooper", LastName = "Barrow", LastLogin = new DateTime(2018, 2, 2), Id = Guid.NewGuid() };
19
20             await TestContext.InsertAsync(bob, alice, cooper);
21
22             var result = await TestContext.SendAsync(new ListMostActive.Query());
23
24             result.Users.Count.ShouldBe(2);
25             result.Users.ShouldContain(x => x.FirstName == "Alice");
26             result.Users.ShouldContain(x => x.FirstName == "Cooper");
27         }
28     }
29 }
30
```



Examples in the wild

Humanitarian Toolbox – already

<https://github.com/HTBox/allReady>

Jimmy Bogard – Contoso University

<https://github.com/jbogard/ContosoUniversityDotNetCore>

Tackling Business Complexity in a Microservice with DDD and CQRS Patterns

<https://bit.ly/msmediatr>

HTBox/allReady: This repo con

+

GitHub, Inc. (US)

https://github.com/HTBox/allReady

...

☆

≡

📄

☰



Search or jump to...

/

Pull requests

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+



HTBox / allReady

👁 Watch

143

★ Star

792

🍴 Fork

573

<> Code

🔔 Issues 233

🔗 Pull requests 12

📁 Projects 1

📖 Wiki

📊 Insights

This repo contains the code for allReady, an open-source solution focused on increasing awareness, efficiency and impact of preparedness campaigns as they are delivered by humanitarian and disaster response organizations in local communities. <http://www.htbox.org/projects/allready>

allready

disaster-response

preparedness-campaigns

volunteers

c-sharp

asp-net-core

📄 3,626 commits

🌿 5 branches

📦 0 releases

👤 164 contributors

📄 MIT

Branch: master ▾

New pull request

Create new file

Upload files

Find File

Clone or download ▾

 **MisterJames** Just a sample scenario for a campaign

Latest commit b3d35a1 7 days ago

📁 AllReadyApp

Updating cdn sources for validation to match fallback

a year ago

📁 SampleData

Update data import to use postcode

2 years ago

📁 docs

Just a sample scenario for a campaign

7 days ago

📁 meetings

Update 2017-08-14 Team Meeting.md

2 years ago

📄 .deployment

move deployment script to the root of the repo

3 years ago

📄 citizens

Added some ignore rules for newish project and solution extensions

2 years ago

allReady/AllReadyApp/Web-App

+

GitHub, Inc. (US) | https://github.com/HTBox/allReady/tree/master/AllReadyApp/Web-App/AllReady/Features

...

🔖

📄

☰

allReady / AllReadyApp / Web-App / AllReady / Features /

Create new fileUpload filesFind fileHistory

 stevejgordon

Converting HomeController pages/action to Razor pages

...

Latest commit e0acef4 on Nov 11, 2017

..

Admin

Removing ConfigureAwait(false) usage

2 years ago

Campaigns

Converting HomeController pages/action to Razor pages

a year ago

ClosestLocation

RTM Changes builds

3 years ago

Events

A lot of test based changes

2 years ago

Home

Converting HomeController pages/action to Razor pages

a year ago

Login

Removing ConfigureAwait(false) usage

2 years ago

Manage

Fixed to display the URL in the confirmation email

2 years ago

Notifications

Fixing some missing task > volunteer task renaming

2 years ago

Organizations

Removing ConfigureAwait(false) usage

2 years ago

Requests

P.M-A - Issue 1585

2 years ago

Resource

a bunch of renamings/code cleanup for mostly MediatR handlers.

2 years ago

Sms

Move phone number validation check into foreach loop along with the a...

2 years ago

Tasks

Casing changes for enums (neglected to commit these in previous push).

2 years ago

Volunteers

Volunteers Dashboard enahnsements

2 years ago

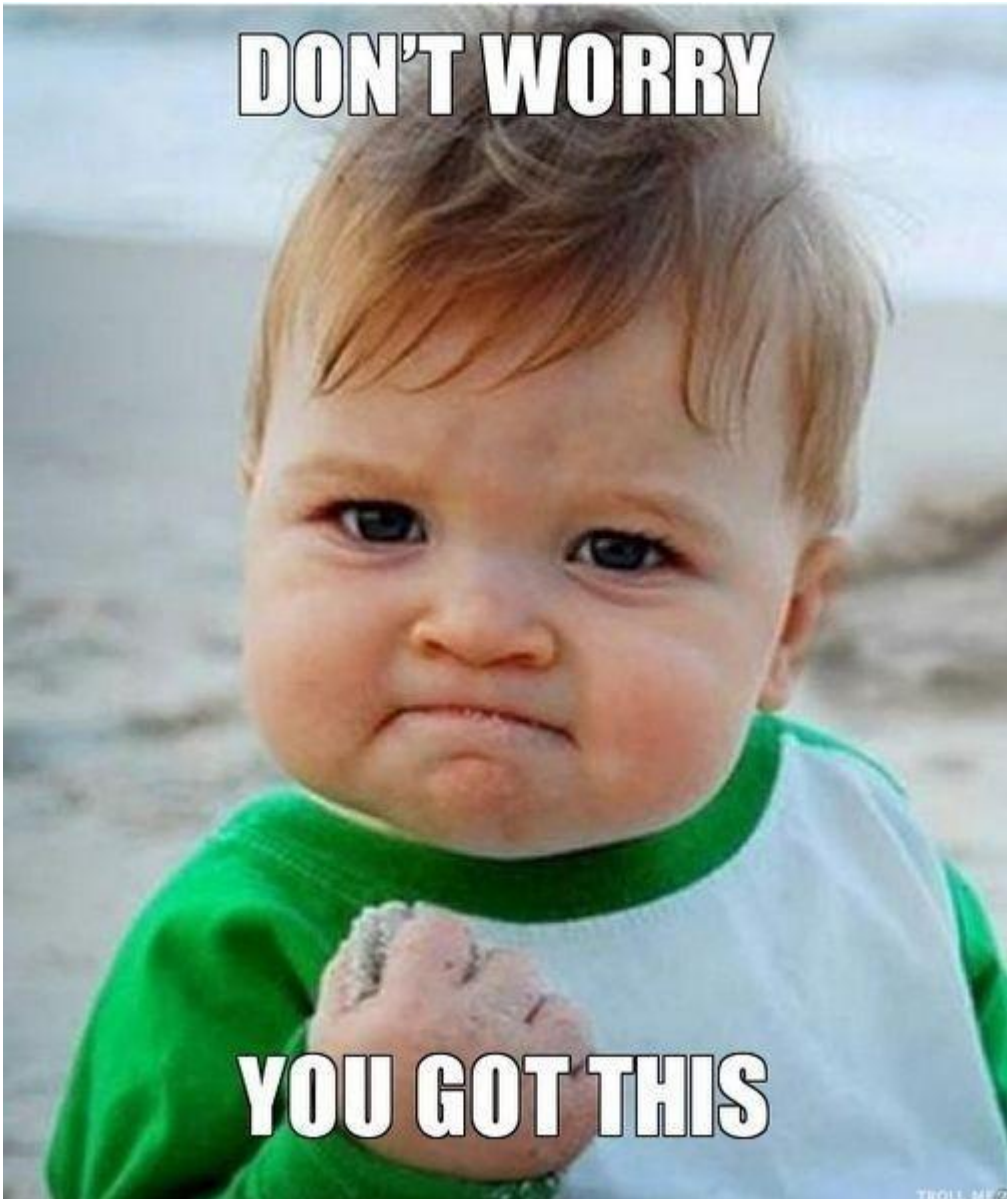
Go back one page
Right-click or pull down to show history

```
namespace AllReady.Features.Organizations
{
    8  {
    9      public class OrganizationDetailsQueryHandler : IAsyncRequestHandler<OrganizationDetailsQuery, OrganizationViewModel>
   10      {
   11          private readonly AllReadyContext _context;
   12
   13          public OrganizationDetailsQueryHandler(AllReadyContext context)
   14          {
   15              _context = context;
   16          }
   17
   18          public async Task<OrganizationViewModel> Handle(OrganizationDetailsQuery message)
   19          {
   20              var result = await _context.Organizations.AsNoTracking()
   21                  .Include(t => t.Campaigns)
   22                  .Include(t => t.Location)
   23                  .SingleOrDefaultAsync(t => t.Id == message.Id);
   24
   25              if (result == null)
   26                  return null;
   27
   28              result.Campaigns.RemoveAll(c => c.Locked);
   29
   30              return new OrganizationViewModel(result);
   31          }
   32      }
   33  }
```


There is no “best” design.

There is only the “best design
given our current understanding”

Jimmy Bogard – “Strengthening your domain” <https://bit.ly/NoBestDesign>



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Thank You



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