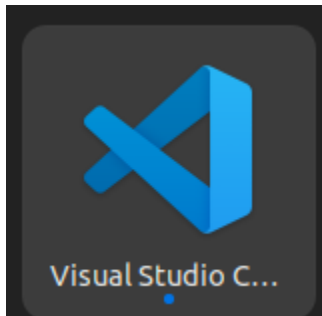


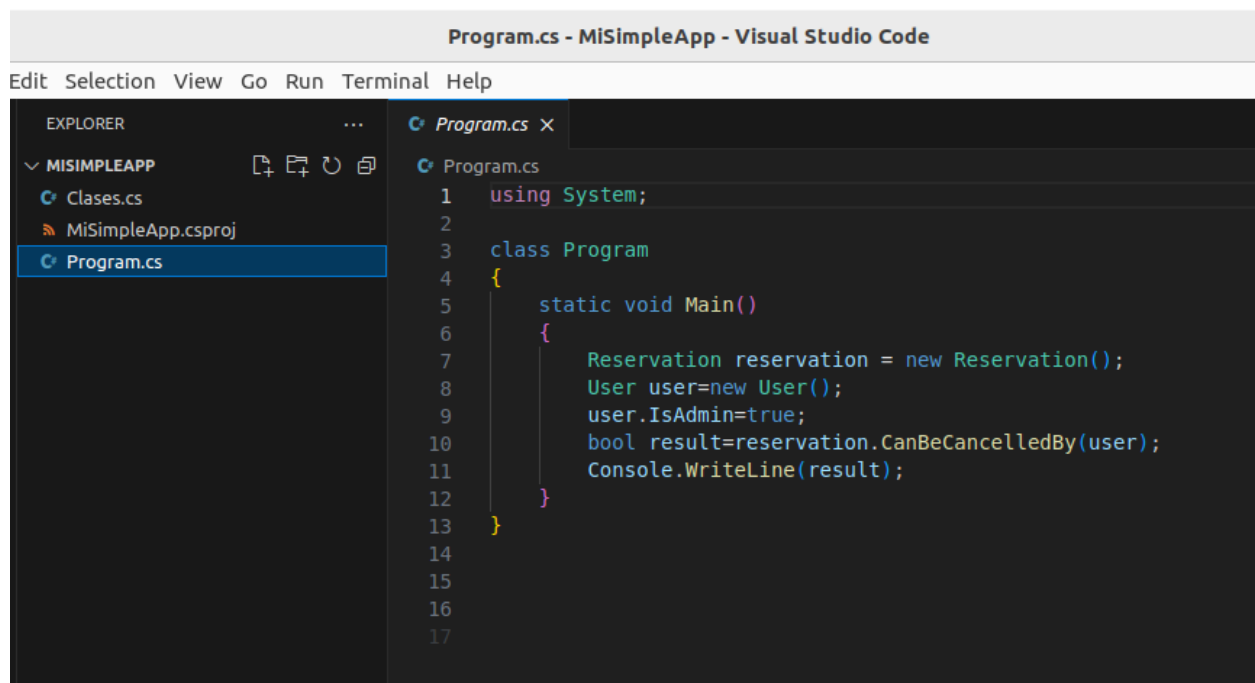
## Trabajo Práctico 9 - Pruebas Unitarias

### 5- Desarrollo de Pruebas Unitarias sobre una aplicación de consola.

#### 5.1 Preparamos el entorno:



```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9$ git clone https://github.com/ingsoft3ucc/MiSimpleApp.git
Cloning into 'MiSimpleApp'...
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (5/5), done.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9$ cd MiSimpleApp/
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleApp$ code .
```



```

tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleApp$ cd ..
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9$ dotnet new nunit -n MiSimpleAppTests
The template "NUnit 3 Test Project" was created successfully.

Processing post-creation actions...
Restoring /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj:
  Determining projects to restore...
  Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj (in 15.95 sec).
Restore succeeded.


```

```

tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet add package NUnit
  Determining projects to restore...
  Writing /tmp/tmpQd0Y6Z.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'NUnit' into project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info :   GET https://api.nuget.org/v3/registration5-gz-semver2/nunit/index.json
info :   OK https://api.nuget.org/v3/registration5-gz-semver2/nunit/index.json 778ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj...
info : Package 'NUnit' is compatible with all the specified frameworks in project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info : PackageReference for package 'NUnit' version '3.13.3' updated in file '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info : Assets file has not changed. Skipping assets file writing. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj (in 179 ms).
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet add package NUnit.ConsoleRunner
  Determining projects to restore...
  Writing /tmp/tmpfX0CiP.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'NUnit.ConsoleRunner' into project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info :   GET https://api.nuget.org/v3/registration5-gz-semver2/nunit.consolerunner/index.json
info :   OK https://api.nuget.org/v3/registration5-gz-semver2/nunit.consolerunner/index.json 1121ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj...
info :   GET https://api.nuget.org/v3-flatcontainer/nunit.consolerunner/index.json
info :   OK https://api.nuget.org/v3-flatcontainer/nunit.consolerunner/index.json 707ms
info :   GET https://api.nuget.org/v3-flatcontainer/nunit.consolerunner/3.16.3/nunit.consolerunner.3.16.3.nupkg
info :   OK https://api.nuget.org/v3-flatcontainer/nunit.consolerunner/3.16.3/nunit.consolerunner.3.16.3.nupkg 73ms
info : Installed NUnit.ConsoleRunner 3.16.3 from https://api.nuget.org/v3/index.json with content hash bhc4f0oVdS70xLaulPu2dMuUWK6hLj5fWLWmUnvbyxEA9w41sZNe6Xb3vPkcp+50rIqggmtcRbHX+o5hoz62Jg==.
info : Package 'NUnit.ConsoleRunner' is compatible with all the specified frameworks in project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info : PackageReference for package 'NUnit.ConsoleRunner' version '3.16.3' added to file '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj'.
info : Generating MSBuild file /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/obj/MiSimpleAppTests.csproj.nuget.g.props.
info : Writing assets file to disk. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiSimpleAppTests.csproj (in 1.34 sec).

```

```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet add ref
erence ../MiSimpleApp/MiSimpleApp.csproj
Reference `..\MiSimpleApp\MiSimpleApp.csproj` added to the project.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ cd ..
```




**C# Dev Kit** v0.5.150 Preview

Microsoft [microsoft.com](https://microsoft.com) | 797,500

Official C# extension from Microsoft

Installing ⚙️



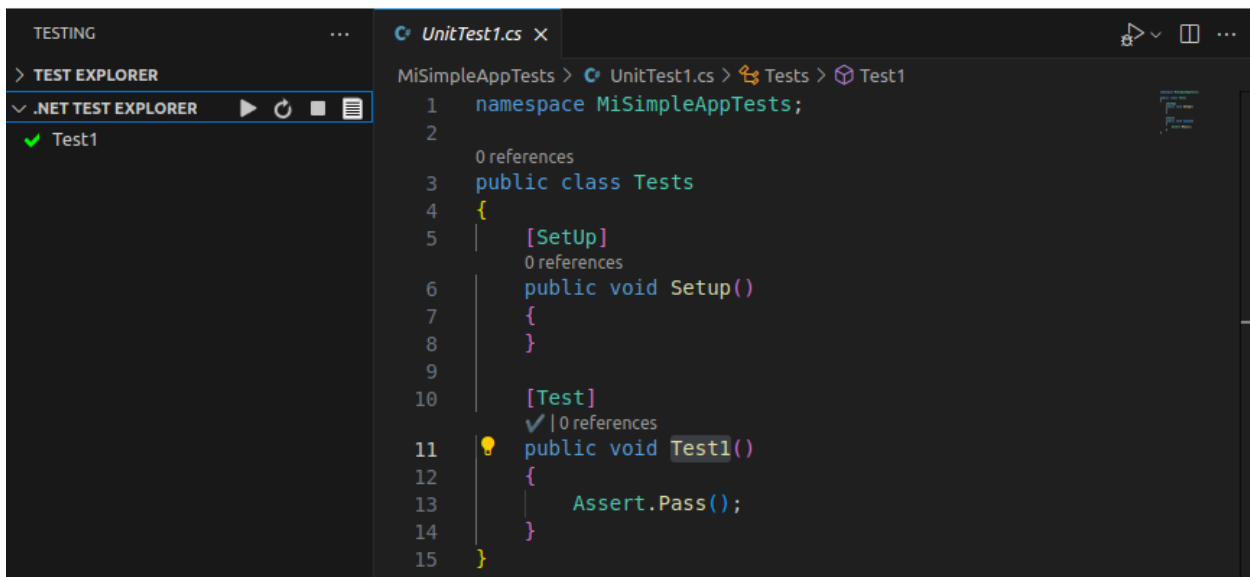
**.NET Core Test Explorer**

Jun Han | 647,762 | ★★★★★ (42)

Test Explorer for .NET Core (MSTest, xUnit, N...

Disable Uninstall ⚙️

This extension is enabled globally.



The screenshot shows the Visual Studio interface. On the left, the 'TESTING' sidebar is open, showing the 'TEST EXPLORER' tab. Under '.NET TEST EXPLORER', a test named 'Test1' is listed with a green checkmark. The main editor area shows the code for 'UnitTest1.cs' in the 'MiSimpleAppTests' project. The code defines a 'Tests' class with a '[SetUp]' method 'Setup()' and a '[Test]' method 'Test1()' which calls 'Assert.Pass()'. The 'Test1()' method is highlighted with a yellow lightbulb icon, indicating a suggestion or warning.

EXPLORER

TP9

- MiSimpleApp
  - bin
  - obj
  - Clases.cs
  - MiSimpleApp.csproj
  - Program.cs
  - MiSimpleAppTests
- TP9.sln

Clases.cs

```
1
2 2 references
3 public class Reservation
4 {
5     1 reference
6     public User MadeBy { get; set; }
7
8     1 reference
9     public bool CanBeCancelledBy(User user)
10    {
11        if (user.IsAdmin)
12            return true;
13        if (MadeBy==user)
14            return true;
15        return false;
16        //return (user.IsAdmin || MadeBy == user);
17    }
18 }
19
20 4 references
21 public class User
22 {
23     2 references
24     public bool IsAdmin { get; set; }
25 }
```

EXPLORER

TP9

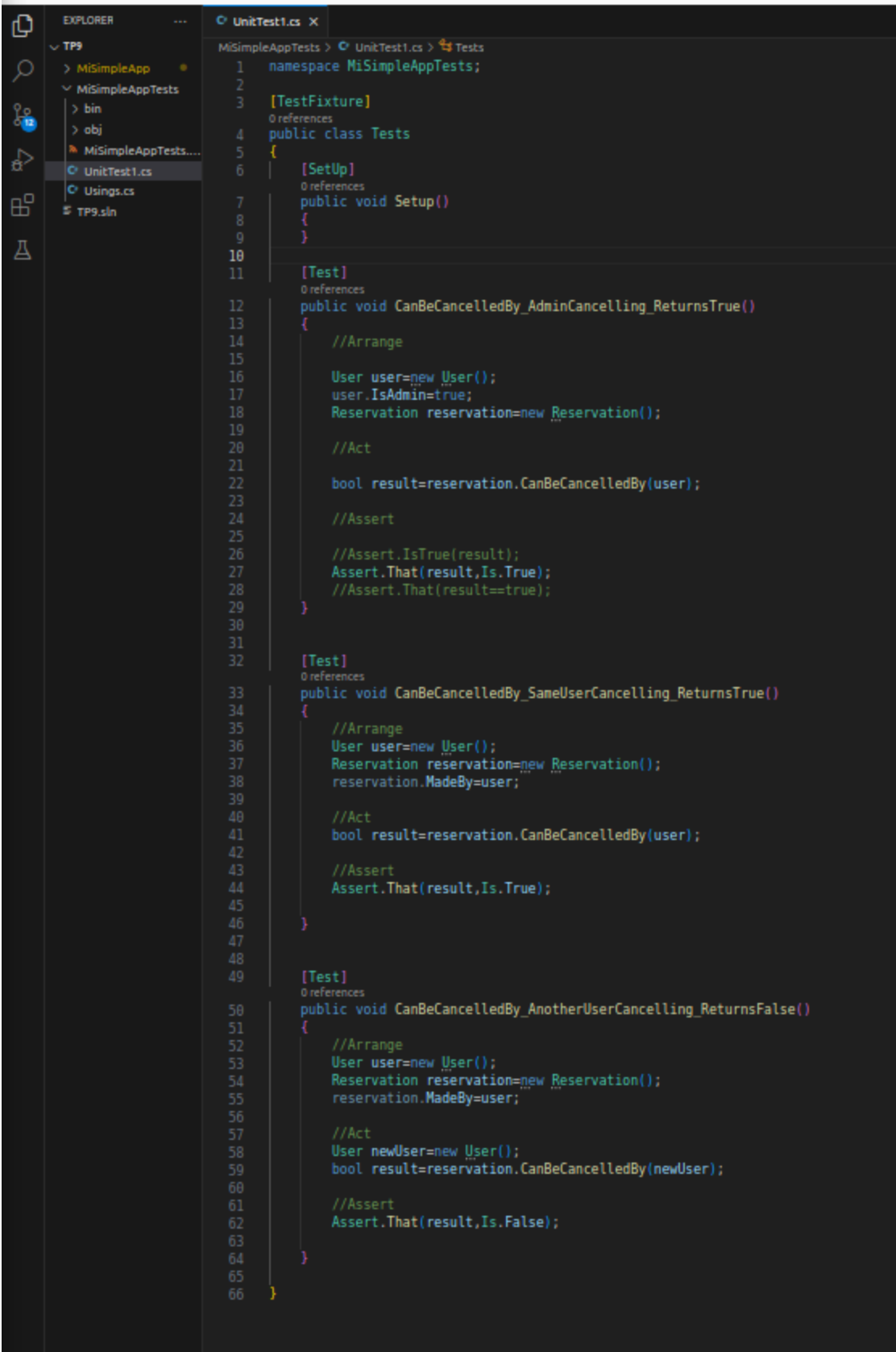
- MiSimpleApp
  - bin
  - obj
  - Clases.cs
  - MiSimpleApp.csproj
  - Program.cs
  - MiSimpleAppTests
- TP9.sln

Program.cs

```
1 using System;
2
3 0 references
4 class Program
5 {
6     0 references
7     static void Main()
8     {
9         Reservation reservation = new Reservation();
10        User user=new User();
11        user.IsAdmin=true;
12        bool result=reservation.CanBeCancelledBy(user);
13        Console.WriteLine(result);
14    }
15 }
16
17 }
```

## 5.2: Creamos nuestros Tests:

File Edit Selection View Go Run Terminal Help



```
1 namespace MiSimpleAppTests;
2
3 [TestFixture]
4 public class Tests
5 {
6     [SetUp]
7     public void Setup()
8     {
9     }
10
11     [Test]
12     public void CanBeCancelledBy_AdminCancelling_ReturnsTrue()
13     {
14         //Arrange
15
16         User user=new User();
17         user.IsAdmin=true;
18         Reservation reservation=new Reservation();
19
20         //Act
21
22         bool result=reservation.CanBeCancelledBy(user);
23
24         //Assert
25
26         //Assert.IsTrue(result);
27         Assert.That(result,Is.True);
28         //Assert.That(result==true);
29     }
30
31
32     [Test]
33     public void CanBeCancelledBy_SameUserCancelling_ReturnsTrue()
34     {
35         //Arrange
36         User user=new User();
37         Reservation reservation=new Reservation();
38         reservation.MadeBy=user;
39
40         //Act
41         bool result=reservation.CanBeCancelledBy(user);
42
43         //Assert
44         Assert.That(result,Is.True);
45     }
46
47
48
49     [Test]
50     public void CanBeCancelledBy_AnotherUserCancelling_ReturnsFalse()
51     {
52         //Arrange
53         User user=new User();
54         Reservation reservation=new Reservation();
55         reservation.MadeBy=user;
56
57         //Act
58         User newUser=new User();
59         bool result=reservation.CanBeCancelledBy(newUser);
60
61         //Assert
62         Assert.That(result,Is.False);
63     }
64
65
66 }
```

### 5.3 Explicamos detalladamente los tests en el entregable

#### Test: CanBeCancelledBy\_AdminCancelling\_ReturnsTrue

**Descripción:** Este test evalúa si una reserva puede ser cancelada por un administrador y espera que el resultado sea verdadero (true).

##### Paso a paso:

- **Arrange:** En esta sección, se prepara el escenario para el test. Se crea un objeto User que representa un usuario y se establece que este usuario es un administrador. Luego, se crea un objeto Reservation que representa una reserva.
- **Act:** En esta sección, se realiza la acción que se va a probar. En este caso, se llama al método CanBeCancelledBy del objeto reservation y se le pasa el objeto user como argumento.
- **Assert:** En esta sección, se verifica si el resultado de la acción (llamar a CanBeCancelledBy) es verdadero. Para hacerlo, se utilizan distintos métodos de aserción. En este caso, se utiliza Assert.That con Is.True para verificar que resulte es verdadero.

#### Test: CanBeCancelledBy\_SameUserCancelling\_ReturnsTrue

**Descripción:** Este test evalúa si una reserva puede ser cancelada por el mismo usuario que la creó y espera que el resultado sea verdadero (true).

##### Paso a paso:

- **Arrange:** Se crea un objeto User y un objeto Reservation. Luego, se establece que la reserva fue creada por el mismo usuario.
- **Act:** Se llama al método CanBeCancelledBy del objeto reservation, pasando el mismo objeto user como argumento.
- **Assert:** Se verifica si el resultado de la acción es verdadero utilizando Assert.That y Is.True.

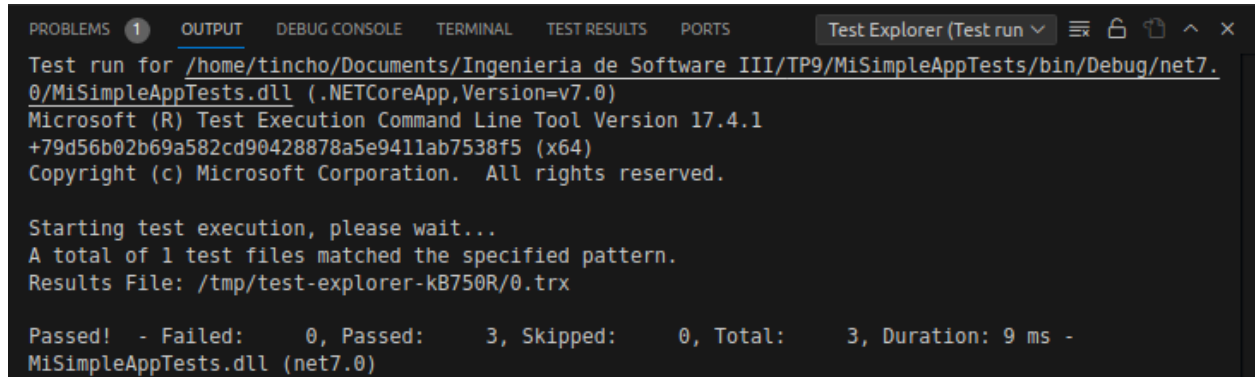
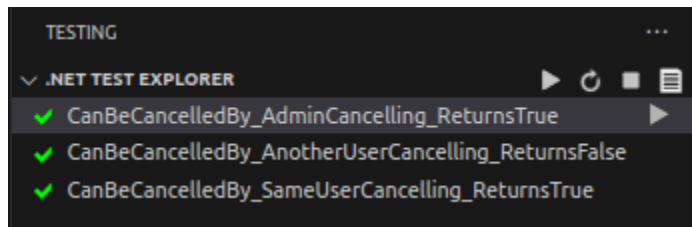
#### Test: CanBeCancelledBy\_AnotherUserCancelling\_ReturnsFalse

**Descripción:** Este test evalúa si una reserva puede ser cancelada por otro usuario que no la creó y espera que el resultado sea falso (false).

##### Paso a paso:

- **Arrange:** Se crea un objeto User y un objeto Reservation. Luego, se establece que la reserva fue creada por el usuario user. Después, se crea un nuevo objeto User llamado newUser.
- **Act:** Se llama al método CanBeCancelledBy del objeto reservation, pasando el objeto newUser como argumento.
- **Assert:** Se verifica si el resultado de la acción es falso utilizando Assert.That y Is.False.

## 5.4 Ejecutamos los tests:





```
UnitTest1.cs  Clases.cs 1, M X
MiSimpleApp > Clases.cs > Reservation > CanBeCancelledBy
1
2      8 references
3      public class Reservation
4      {
5          3 references
6          public User MadeBy { get; set; }
7
8          4 references
9          public bool CanBeCancelledBy(User user)
10         {
11             if (user.IsAdmin)
12                 return false;
13             if (MadeBy==user)
14                 return true;
15             return false;
16
17             //return (user.IsAdmin || MadeBy == user);
18         }
19
20     12 references
21     public class User
22     {
23         3 references
24         public bool IsAdmin { get; set; }
25     }
```

TESTING

▼ .NET TEST EXPLORER

- ✖ CanBeCancelledBy\_AdminCancelling\_ReturnsTrue
- ✔ CanBeCancelledBy\_AnotherUserCancelling\_ReturnsFalse
- ✔ CanBeCancelledBy\_SameUserCancelling\_ReturnsTrue

PROBLEMS 2 OUTPUT DEBUG CONSOLE ... Test Explorer (Te) ⌵

Test run for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/bin/Debug/net7.0/MiSimpleAppTests.dll (.NETCoreApp,Version=v7.0)

Microsoft (R) Test Execution Command Line Tool Version 17.4.1  
+79d56b02b69a582cd90428878a5e9411ab7538f5 (x64)  
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...

A total of 1 test files matched the specified pattern.

Failed CanBeCancelledBy\_AdminCancelling\_ReturnsTrue [35 ms]

Error Message:

Expected: True

But was: False

Stack Trace:

at MiSimpleAppTests.Tests.  
CanBeCancelledBy\_AdminCancelling\_ReturnsTrue() in /home/  
tincho/Documents/Ingenieria de Software III/TP9/  
MiSimpleAppTests/UnitTest1.cs:line 27

Results File: /tmp/test-explorer-kB750R/0.trx

Failed! - Failed: 1, Passed: 2, Skipped: 0,  
Total: 3, Duration: 38 ms - MiSimpleAppTests.dll (net7.0)

Clases.cs 1 x

MiSimpleApp > Clases.cs > ...

```
1
2      8 references
3      public class Reservation
4      {
5          3 references
6          public User MadeBy { get; set; }
7
8          4 references
9          public bool CanBeCancelledBy(User user)
10         {
11             if (user.IsAdmin)
12                 return true;
13             if (MadeBy==user)
14                 return true;
15             return false;
16
17             //return (user.IsAdmin || MadeBy == user);
18         }
19     }
20
21     12 references
22     public class User
23     {
24         3 references
25         public bool IsAdmin { get; set; }
26     }
```

```
Clases.cs 1, M X
MiSimpleApp > Clases.cs > Reservation > CanBeCancelledBy
1
2      8 references
3      public class Reservation
4      {
5          3 references
6          public User MadeBy { get; set; }
7
8          4 references
9          public bool CanBeCancelledBy(User user)
10         {
11             /*if (user.IsAdmin)
12                 return true;
13             if (MadeBy==user)
14                 return true;
15             return false;*/
16
17             return (user.IsAdmin || MadeBy == user);
18         }
19     }
20
21     12 references
22     public class User
23     {
24         3 references
25         public bool IsAdmin { get; set; }
26     }
27 }
```

```
tincho@IdeaPad-5-14ALC05:~$ cd Documents/Ingenieria\ de\ Software\ III\TP9\MiSimpleAppTests/
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet test
Determining projects to restore...
All projects are up-to-date for restore.
/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleApp/Clases.cs(4,21): warning CS8618: Non-nullable property 'MadeBy' must contain a non-null value when exiting constructor. Consider declaring the property as nullable. [/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleApp/MiSimpleApp.csproj]
MiSimpleApp -> /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleApp/bin/Debug/net7.0/MiSimpleApp.dll
MiSimpleAppTests -> /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/bin/Debug/net7.0/MiSimpleAppTests.dll
Test run for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/bin/Debug/net7.0/MiSimpleAppTests.dll (.NETCoreApp,Version=v7.0)
Microsoft (R) Test Execution Command Line Tool Version 17.4.1+79d56b02b69a582cd90428878a5e9411ab7538f5 (x64)
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...
A total of 1 test files matched the specified pattern.

Passed! - Failed:      0, Passed:      3, Skipped:      0, Total:      3, Duration: 9 ms - MiSimpleAppTests.dll (net7.0)
```

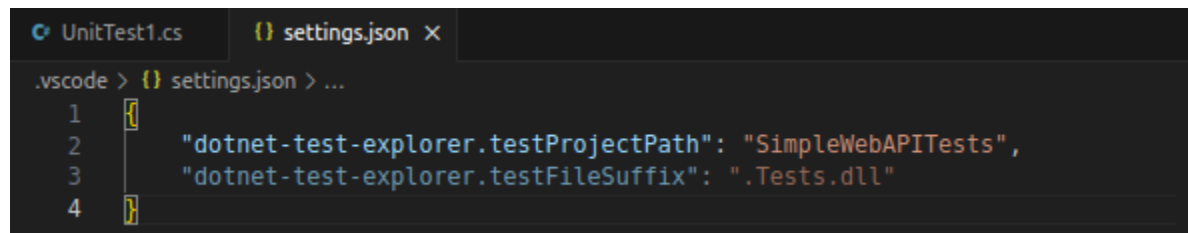
## 6- Desarrollo de Pruebas Unitarias sobre una WebAPI:

### 6.1 Preparamos el entorno:

```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ git clone http
s://github.com/tincholescanso/SimpleWebAPI.git
Cloning into 'SimpleWebAPI'...
remote: Enumerating objects: 51, done.
remote: Counting objects: 100% (51/51), done.
remote: Compressing objects: 100% (43/43), done.
remote: Total 51 (delta 7), reused 34 (delta 2), pack-reused 0
Receiving objects: 100% (51/51), 146.79 KiB | 1.03 MiB/s, done.
Resolving deltas: 100% (7/7), done.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet new nunit
it -n SimpleWebAPITests
The template "NUnit 3 Test Project" was created successfully.

Processing post-creation actions...
Restoring /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/SimpleWebAPITests/S
impleWebAPITests.csproj:
  Determining projects to restore...
  Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/SimpleWebAPITests/
SimpleWebAPITests.csproj (in 579 ms).
Restore succeeded.

tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ cd SimpleWebAP
ITests
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/SimpleWebAPITes
ts$ dotnet add reference ../SimpleWebAPI/SimpleWebAPI/SimpleWebAPI.csproj
Reference `..\SimpleWebAPI\SimpleWebAPI\SimpleWebAPI.csproj` added to the project.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/SimpleWebAPITes
ts$ cd ..
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ code .
```



```
.vscode > {} settings.json > ...
1  {}
2  "dotnet-test-explorer.testProjectPath": "SimpleWebAPITests",
3  "dotnet-test-explorer.testFileSuffix": ".Tests.dll"
4  }
```

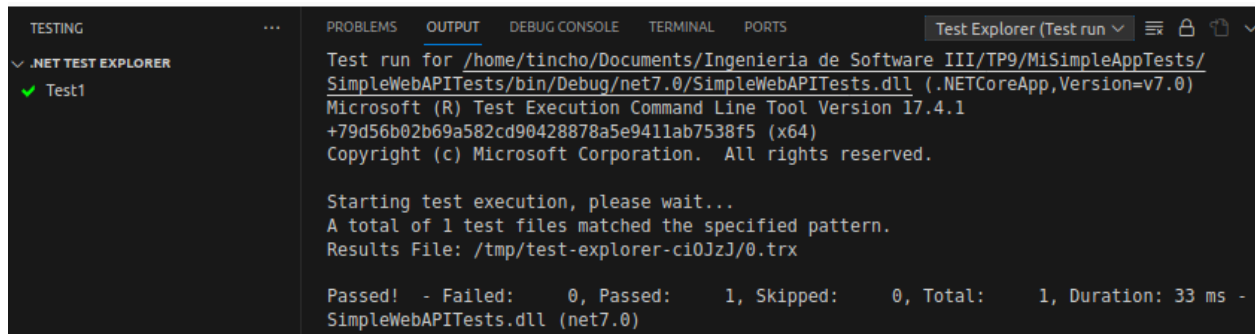
```
1 using Microsoft.Extensions.Logging;
2 using NUnit.Framework;
3 using SimpleWebAPI.Controllers;
4 using System;
5 using System.Linq;
6
7 namespace SimpleWebAPI.Tests
8 {
9     [TestFixture]
10    public class WeatherForecastControllerTests
11    {
12        [Test]
13        public void Get_ReturnsWeatherForecasts()
14        {
15            // Arrange
16            ILogger<WeatherForecastController> logger = new LoggerFactory();
17            var controller = new WeatherForecastController(logger);
18
19            // Act
20            var result = controller.Get();
21
22            // Assert
23            Assert.NotNull(result);
24            Assert.AreEqual(5, result.Count());
25        }
26    }
27 }
```

## Test: Get\_ReturnsWeatherForecasts

**Descripción:** Este test evalúa el comportamiento del método Get en el controlador WeatherForecastController y verifica que el resultado sea una colección de pronósticos del clima.

### Paso a paso:

- **Arrange:** En esta sección, se prepara el escenario para el test. Primero, se crea un objeto `ILogger<WeatherForecastController>` que representa un registrador de eventos para el controlador. Luego, se crea una instancia del controlador `WeatherForecastController`, pasándole el registrador de eventos.
- **Act:** En esta sección, se realiza la acción que se va a probar. En este caso, se llama al método `Get` del controlador, que es el método que se espera que retorne los pronósticos del clima.
- **Assert:** En esta sección, se verifican los resultados de la acción. Se realizan dos aserciones:
  - **Assert.NotNull(result):** Se verifica que el resultado (`result`) no sea nulo. Esto asegura que se haya devuelto algún valor y que no sea una respuesta vacía.
  - **Assert.AreEqual(5, result.Count()):** Se verifica que el número de elementos en la colección `result` sea igual a 5. Esto significa que se esperan cinco pronósticos del clima en la respuesta.



## 8- Utilizando Moq

### 8.1 Preparamos el entorno.

```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ git clone https://github.com/ingsoft3ucc/MiNotSoSimpleApp.git
Cloning into 'MiNotSoSimpleApp'...
remote: Enumerating objects: 22, done.
remote: Counting objects: 100% (22/22), done.
remote: Compressing objects: 100% (21/21), done.
remote: Total 22 (delta 6), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (22/22), 5.19 KiB | 5.19 MiB/s, done.
Resolving deltas: 100% (6/6), done.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ cd MiNotSoSimpleApp/
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleApp$ code .
```

EXPLORER

MINOTSO SIMPLEAPP

> .vscode

> bin

> obj

APIService.cs1

IAPIService.cs

MiNotSoSimpleApp.csproj

MiNotSoSimpleApp.sln0

MyModel.cs2

Program.cs

Program.cs X

Program.cs > ...

```
1 using System;
2 using System.Net.Http;
3 using System.Net.Http.Json;
4 using System.Threading.Tasks;
5 using Microsoft.Extensions.DependencyInjection;
6
7 namespace MyApp
8 {
9     0 references
10    class Program
11    {
12        0 references
13        static async Task Main()
14        {
15            var serviceProvider = new ServiceCollection()
16                .AddHttpClient()
17                .AddTransient<IAPIService, ApiService>()
18                .BuildServiceProvider();
19
20            var apiService = serviceProvider.GetRequiredService<IAPIService>();
21
22            var myModels = await apiService.GetMyModelsAsync();
23            foreach (var model in myModels)
24            {
25                Console.WriteLine($"Id: {model.Id}, Title: {model.Title}");
26            }
27        }
28    }
```

PROBLEMS3

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

Filter (e.g. text, !exclude)

Id: 77, Title: necessitatibus quasi exercitationem odio

Id: 78, Title: quam voluptatibus rerum veritatis

Id: 79, Title: pariatur consequatur quia magnam autem omnis non amet

Id: 80, Title: labore in ex et explicabo corporis aut quas

Id: 81, Title: tempora rem veritatis voluptas quo dolores vero

Id: 82, Title: laudantium voluptate suscipit sunt enim enim

Id: 83, Title: odit et voluptates doloribus alias odio et

Id: 84, Title: optio ipsam molestias necessitatibus occaecati facilis veritatis dolores aut

Id: 85, Title: dolore veritatis porro provident adipisci blanditiis et sunt

Id: 86, Title: placeat quia et porro iste

Id: 87, Title: nostrum quis quasi placeat

Id: 88, Title: sapiente omnis fugit eos

Id: 89, Title: sint soluta et vel magnam aut ut sed qui

Id: 90, Title: ad iusto omnis odit dolor voluptatibus

Id: 91, Title: aut amet sed

Id: 92, Title: ratione ex tenetur perferendis

Id: 93, Title: beatae soluta recusandae

Id: 94, Title: qui qui voluptates illo iste minima

Id: 95, Title: id minus libero illum nam ad officiis

Id: 96, Title: quaerat velit veniam amet cupiditate aut numquam ut sequi

Id: 97, Title: quas fugiat ut perspiciatis vero provident

Id: 98, Title: laboriosam dolor voluptates

Id: 99, Title: temporibus sit alias delectus eligendi possimus magni

Id: 100, Title: at nam consequatur ea labore ea harum

> OUTLINE

> TIMELINE

Se están utilizando varios espacios de nombres, incluyendo System, System.Net.Http, System.Net.Http.Json, System.Threading.Tasks y Microsoft.Extensions.DependencyInjection. Estos espacios de nombres proporcionan las funcionalidades necesarias para trabajar con HTTP y la inyección de dependencias.

Se utiliza la inyección de dependencias a través del paquete Microsoft.Extensions.DependencyInjection. Se crea un contenedor de servicios (ServiceProvider) que se utilizará para obtener instancias de clases que dependen de interfaces.

Dentro del contenedor de servicios, se registran los servicios necesarios:

- AddHttpClient(): Registra un cliente HTTP que se utilizará para realizar solicitudes HTTP a un servicio externo. Esto es parte del manejo de servicios HTTP proporcionado por ASP.NET Core.
- AddTransient<IApiService, ApiService>(): Registra la implementación de IApiService como un servicio transitorio. Esto significa que cada vez que se solicite un servicio que implemente IApiService, se creará una nueva instancia de ApiService.

Se obtiene una instancia de IApiService del contenedor de servicios utilizando GetRequiredService. Esta instancia se utilizará para interactuar con el servicio externo.

Se llama al método GetMyModelsAsync() en ApiService, que presumiblemente realiza una solicitud HTTP a un servicio externo y devuelve una colección de modelos.

Los modelos devueltos por la API se iteran, y sus propiedades (Id y Title) se muestran en la consola.

IApiService.cs:

Es una interfaz que define un contrato para interactuar con un servicio externo.

En este caso, la interfaz declara un método GetMyModelsAsync que debería devolver una colección de elementos de tipo Post.

ApiService.cs:

Es una clase que implementa la interfaz IApiService. La clase tiene un constructor que recibe un parámetro de tipo HttpClient, lo que indica que se está utilizando la funcionalidad de cliente HTTP proporcionada por ASP.NET Core.

El método GetMyModelsAsync hace uso de HttpClient para realizar una solicitud HTTP a la URL "https://jsonplaceholder.typicode.com/posts/".

Luego, se asegura de que la solicitud sea exitosa (EnsureSuccessStatusCode).

Finalmente, se deserializa la respuesta JSON en una colección de elementos Post utilizando ReadFromJsonAsync.



```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleApp
p$ cd ..
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ dotnet new nunit
-n MiNotSoSimpleAppTest
The template "NUnit 3 Test Project" was created successfully.

Processing post-creation actions...
Restoring /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTes
t/MiNotSoSimpleAppTest.csproj:
  Determining projects to restore...
  Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTe
st/MiNotSoSimpleAppTest.csproj (in 444 ms).
Restore succeeded.

tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ cd MiNotSoSimp
leAppTest/
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAp
pTest$ dotnet add reference ../MiNotSoSimpleApp/MiNotSoSimpleApp.csproj
Reference `..\MiNotSoSimpleApp\MiNotSoSimpleApp.csproj` added to the project.
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAp
pTest$ dotnet add package NUnit
  Determining projects to restore...
  Writing /tmp/tmpXPX1UG.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotn
et/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotn
et/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'NUnit' into project '/home/tincho/Documents/Ingenieria d
e Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info :   GET https://api.nuget.org/v3/registration5-gz-semver2/nunit/index.json
info :   OK https://api.nuget.org/v3/registration5-gz-semver2/nunit/index.json 1274ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests
/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj...
info : Package 'NUnit' is compatible with all the specified frameworks in project '/home/tincho/Docu
ments/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.cspr
oj'.
info : PackageReference for package 'NUnit' version '3.13.3' updated in file '/home/tincho/Documents
/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : Generating MSBuild file /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTest
s/MiNotSoSimpleAppTest/obj/MiNotSoSimpleAppTest.csproj.nuget.g.targets.
info : Writing assets file to disk. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSi
mpleAppTests/MiNotSoSimpleAppTest/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimple
AppTest/MiNotSoSimpleAppTest.csproj (in 190 ms).
```

```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest$ dotnet add package Moq
Determining projects to restore...
Writing /tmp/tmpqnLHFa.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'Moq' into project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : GET https://api.nuget.org/v3/registration5-gz-semver2/moq/index.json
info : OK https://api.nuget.org/v3/registration5-gz-semver2/moq/index.json 1036ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj...
info : GET https://api.nuget.org/v3-flatcontainer/moq/index.json
info : OK https://api.nuget.org/v3-flatcontainer/moq/index.json 813ms
info : GET https://api.nuget.org/v3-flatcontainer/moq/4.20.69/moq.4.20.69.nupkg
info : OK https://api.nuget.org/v3-flatcontainer/moq/4.20.69/moq.4.20.69.nupkg 50ms
info : GET https://api.nuget.org/v3-flatcontainer/castle.core/index.json
info : OK https://api.nuget.org/v3-flatcontainer/castle.core/index.json 682ms
info : GET https://api.nuget.org/v3-flatcontainer/castle.core/5.1.1/castle.core.5.1.1.nupkg
info : OK https://api.nuget.org/v3-flatcontainer/castle.core/5.1.1/castle.core.5.1.1.nupkg 20ms
info : GET https://api.nuget.org/v3-flatcontainer/system.diagnostics.eventlog/index.json
info : OK https://api.nuget.org/v3-flatcontainer/system.diagnostics.eventlog/index.json 685ms
info : GET https://api.nuget.org/v3-flatcontainer/system.diagnostics.eventlog/6.0.0/system.diagnostics.eventlog.6.0.0.nupkg
info : OK https://api.nuget.org/v3-flatcontainer/system.diagnostics.eventlog/6.0.0/system.diagnostics.eventlog.6.0.0.nupkg 19ms
info : Installed Moq 4.20.69 from https://api.nuget.org/v3/index.json with content hash 8P/oAUOL8ZVyXnzBBcgdhTsOD1kQbAWfocMI7KDQ03HqQtzB/0WYLDnMa4Jefv8nu/MQYIiG0IuoJdvG0v0Nig==.
info : Installed System.Diagnostics.EventLog 6.0.0 from https://api.nuget.org/v3/index.json with content hash lcyUiXTsETK2ALsZrX+nWuHSIQeazhqPphLfARxzdGaG93+0kELqpgEhtwW0lQe7+jSFnKwaCAgL4kjeZCQJnw==.
info : Installed Castle.Core 5.1.1 from https://api.nuget.org/v3/index.json with content hash rpYtIczkzGpf+EkZgDr9CCLTdemhsrwA/W5hMoPjLkRFnXzH44zDLoovXeKtmxb1ykXK9aJVODSpiJml8CTw2g==.
info : Package 'Moq' is compatible with all the specified frameworks in project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : PackageReference for package 'Moq' version '4.20.69' added to file '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : Writing assets file to disk. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj (in 2.66 sec).
```

```

tincho@IdeaPad-5-14LC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest$ dotnet add package Microsoft.Extensions.Http
    Determining projects to restore...
    Writing /tmp/tmpGZF5iF.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'Microsoft.Extensions.Http' into project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info :   GET https://api.nuget.org/v3/registration5-gz-semver2/microsoft.extensions.http/index.json
info :   OK https://api.nuget.org/v3/registration5-gz-semver2/microsoft.extensions.http/index.json 1066ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj...
info : Package 'Microsoft.Extensions.Http' is compatible with all the specified frameworks in project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : PackageReference for package 'Microsoft.Extensions.Http' version '7.0.0' added to file '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : Writing assets file to disk. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj (in 169 ms).
tincho@IdeaPad-5-14LC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest$ dotnet add package Microsoft.Extensions.DependencyInjection
    Determining projects to restore...
    Writing /tmp/tmpILZYrj.tmp
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/codesignctl.pem'.
info : X.509 certificate chain validation will use the fallback certificate bundle at '/usr/lib/dotnet/sdk/7.0.112/trustedroots/timestampctl.pem'.
info : Adding PackageReference for package 'Microsoft.Extensions.DependencyInjection' into project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info :   GET https://api.nuget.org/v3/registration5-gz-semver2/microsoft.extensions.dependencyinjection/index.json
info :   OK https://api.nuget.org/v3/registration5-gz-semver2/microsoft.extensions.dependencyinjection/index.json 1423ms
info : Restoring packages for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj...
info : Package 'Microsoft.Extensions.DependencyInjection' is compatible with all the specified frameworks in project '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : PackageReference for package 'Microsoft.Extensions.DependencyInjection' version '7.0.0' added to file '/home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj'.
info : Writing assets file to disk. Path: /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/obj/project.assets.json
log : Restored /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/MiNotSoSimpleAppTest.csproj (in 168 ms).

```

## 8.2 Escribimos Test:

```
Unit1.cs x
Unit1.cs > ...
1  using System;
2  using System.Collections.Generic;
3  using System.Net;
4  using System.Net.Http;
5  using System.Net.Http.Json;
6  using System.Threading.Tasks;
7  using Microsoft.Extensions.DependencyInjection;
8  using Moq;
9  using NUnit.Framework;
10 using Moq.Protected;
11
12 namespace MiNotSoSimpleAppTests
13 {
14     0 references
15     public class ApiServiceTests
16     {
17         [Test]
18         0 references
19         public async Task GetMyModelsAsync_ReturnsDataFromHttpClient()
20         {
21             // Arrange
22             var serviceCollection = new ServiceCollection();
23             var mockResponse = new HttpResponseMessage(HttpStatusCode.OK)
24             {
25                 Content = new StringContent("[{ \"UserId\": 1, \"Id\": 1, \"
26             });
27
28             var mockHttpMessageHandler = new Mock<HttpMessageHandler>();
29             mockHttpMessageHandler.Protected()
30                 .Setup<Task<HttpResponseMessage>>("SendAsync", ItExpr.IsAny<HttpRequestMessage>(),
31                 .ReturnsAsync(mockResponse);
32
33             serviceCollection.AddTransient<IApiService>(_ => new ApiService());
34             var serviceProvider = serviceCollection.BuildServiceProvider();
35             var apiService = serviceProvider.GetRequiredService<IApiService>();
36
37             // Act
38             var result = await apiService.GetMyModelsAsync();
39
40             // Assert
41             Assert.IsNotNull(result);
42             Assert.AreEqual(1, result.Count());
43             Assert.AreEqual("Test Title", result.FirstOrDefault().Title);
44         }
45     }
```

En este caso, estamos reemplazando el cliente HTTP real con un objeto simulado para aislar y probar específicamente la lógica de ApiService.

### Arrange (Preparar):

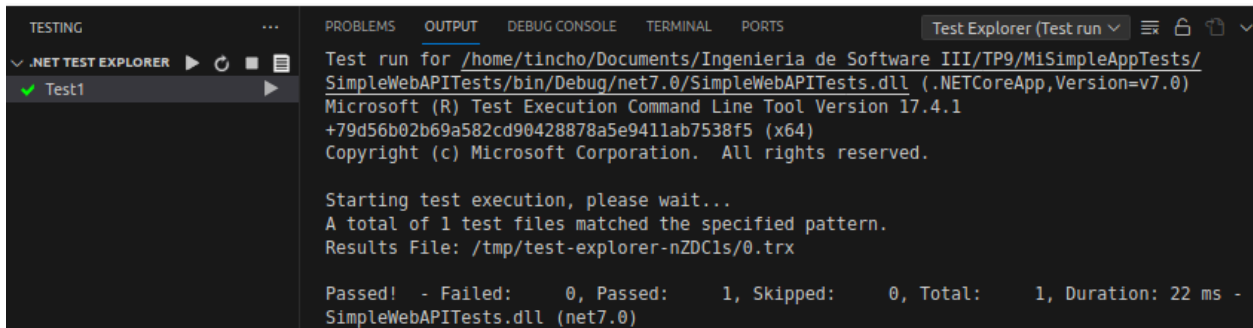
- Se configura un serviceCollection de servicios, que se utilizará para construir un serviceProvider. Esto se hace para simular el entorno de inyección de dependencias (DI) que se utiliza en ASP.NET Core.
- Se crea un objeto mockResponse que simula una respuesta HTTP exitosa.
- Se crea un objeto mockHttpRequestHandler utilizando Moq, que se utiliza para "interceptar" las solicitudes HTTP y retornar la respuesta simulada.
- Dentro de mockHttpRequestHandler, se configura el método SendAsync para que siempre retorne el mockResponse en lugar de realizar una solicitud real.

### Act (Actuar):

- Se crea una instancia de IApiService, pero en lugar de utilizar una instancia real de HttpClient, se le pasa el mockHttpRequestHandler. Esto simula el comportamiento de un servicio HTTP real.

### Assert (Afirmary):

- Se llama al método GetMyModelsAsync en apiService, que debería utilizar el mockHttpRequestHandler para obtener una respuesta simulada en lugar de hacer una solicitud HTTP real.
- Se verifican los resultados de la llamada. En este caso, se asegura que la respuesta no sea nula, que contenga un elemento y que el título coincida con "Test Title".



The screenshot shows the Visual Studio Test Explorer interface. On the left, under the 'TESTING' tab, there is a tree view with a single test item 'Test1' marked with a green checkmark. The main pane on the right displays the output of the test run. The text in the output pane reads: 'Test run for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/SimpleWebAPITests/bin/Debug/net7.0/SimpleWebAPITests.dll (.NETCoreApp,Version=v7.0) Microsoft (R) Test Execution Command Line Tool Version 17.4.1 +79d56b02b69a582cd90428878a5e9411ab7538f5 (x64) Copyright (c) Microsoft Corporation. All rights reserved. Starting test execution, please wait... A total of 1 test files matched the specified pattern. Results File: /tmp/test-explorer-nZDC1s/0.trx Passed! - Failed: 0, Passed: 1, Skipped: 0, Total: 1, Duration: 22 ms - SimpleWebAPITests.dll (net7.0)'. The status bar at the bottom of the window also shows 'Passed! - Failed: 0, Passed: 1, Skipped: 0, Total: 1, Duration: 22 ms - SimpleWebAPITests.dll (net7.0)'.

```
TESTING ...
.NET TEST EXPLORER
Test1

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Test Explorer (Test run)
Test run for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/
SimpleWebAPITests/bin/Debug/net7.0/SimpleWebAPITests.dll (.NETCoreApp,Version=v7.0)
Microsoft (R) Test Execution Command Line Tool Version 17.4.1
+79d56b02b69a582cd90428878a5e9411ab7538f5 (x64)
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...
A total of 1 test files matched the specified pattern.
Results File: /tmp/test-explorer-nZDC1s/0.trx

Passed! - Failed: 0, Passed: 1, Skipped: 0, Total: 1, Duration: 22 ms -
SimpleWebAPITests.dll (net7.0)
```



```
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ ls
bin                MiNotSoSimpleAppTest  obj                SimpleWebAPITests  Usings.cs
MiNotSoSimpleApp  MiSimpleAppTests.csproj SimpleWebAPI       UnitTest1.cs
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests$ cd MiNotSoSimpleAppTest/
tincho@IdeaPad-5-14ALC05:~/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest$ dotnet test
  Determining projects to restore...
  All projects are up-to-date for restore.
  MiNotSoSimpleApp -> /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleApp/bin/Debug/net7.0/MiNotSoSimpleApp.dll
  MiNotSoSimpleAppTest -> /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/bin/Debug/net7.0/MiNotSoSimpleAppTest.dll
Test run for /home/tincho/Documents/Ingenieria de Software III/TP9/MiSimpleAppTests/MiNotSoSimpleAppTest/bin/Debug/net7.0/MiNotSoSimpleAppTest.dll (.NETCoreApp,Version=v7.0)
Microsoft (R) Test Execution Command Line Tool Version 17.4.1+79d56b02b69a582cd90428878a5e9411ab7538f5 (x64)
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...
A total of 1 test files matched the specified pattern.

Passed! - Failed:    0, Passed:    1, Skipped:    0, Total:    1, Duration: 25 ms - MiNotSoSimpleAppTest.dll (net7.0)
```