

Experiment: 2.2

Student Name: Sandeep Kumar

Branch: BE-CSE

Semester: 6th

Subject Name: Dotnet Lab

UID: 20BCS4885

Section/Group: 603/A

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Aim of the practical:

Develop a unit test project in .net core framework

Solution:

In this section, a solution is created that contains the source and test projects. The completed solution has the following directory structure:

Code:

```
/unit-testing-using-dotnet-test
  unit-testing-using-dotnet-test.sln
  /PrimeService
    PrimeService.cs
    PrimeService.csproj
  /PrimeService.Tests
    PrimeService_IsPrimeShould.cs
    PrimeServiceTests.csproj
```

The following instructions provide the steps to create the test solution. See Commands to create test solution for instructions to create the test solution in one step.

Open a shell window.

Run the following command:

dotnet new classlib -o PrimeService

The dotnet new classlib command creates a new class library project in the PrimeService folder. The new class library will contain the code to be tested.

Rename Class1.cs to PrimeService.cs.

Replace the code in PrimeService.cs with the following code:

Code:

using System;

```
namespace Prime.Services
{
    public class PrimeService
    {
        public bool IsPrime(int candidate)
        {
            throw new NotImplementedException("Not implemented.");
        }
    }
}
```

The preceding code:

Throws a `NotImplementedException` with a message indicating it's not implemented.

Is updated later in the tutorial.

In the `unit-testing-using-dotnet-test` directory, run the following command to add the class library project to the solution:

```
dotnet sln add ./PrimeService/PrimeService.csproj
```

Create the `PrimeService.Tests` project by running the following command:

```
dotnet new xunit -o PrimeService.Tests
```

The preceding command:

Creates the `PrimeService.Tests` project in the `PrimeService.Tests` directory. The test project uses `xUnit` as the test library.

Configures the test runner by adding the following `<PackageReference />`elements to the project file:

```
Microsoft.NET.Test.Sdk
xunit
xunit.runner.visualstudio
coverlet.collector
```

Add the test project to the solution file by running the following command:

```
dotnet sln add ./PrimeService.Tests/PrimeService.Tests.csproj
```

Create a test:

A popular approach in test driven development (TDD) is to write a (failing) test before implementing the target code. This tutorial uses the TDD approach. The IsPrime method is callable, but not implemented. A test call to IsPrime fails. With TDD, a test is written that is known to fail. The target code is updated to make the test pass. You keep repeating this approach, writing a failing test and then updating the target code to pass.

Update the PrimeService.Tests project:

Delete PrimeService.Tests/UnitTest1.cs.

Create a PrimeService.Tests/PrimeService_IsPrimeShould.cs file.

Replace the code in PrimeService_IsPrimeShould.cs with the following code:

Code:

```
using Xunit;
```

```
using Prime.Services;
```

```
namespace Prime.UnitTests.Services
```

```
{
```

```
    public class PrimeService_IsPrimeShould
```

```
    {
```

```
        [Fact]
```

```
        public void IsPrime_InputIs1_ReturnFalse()
```

```
        {
```

```
            var primeService = new PrimeService();
```

```
            bool result = primeService.IsPrime(1);
```

```
            Assert.False(result, "1 should not be prime");
```

```
        }
```

```
    }
```

```
}
```

Output:

```
Command Prompt
C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests>dotnet new -t xunittest
Created new C# project in C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests
.

C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests>dir
Volume in drive C is Windows
Volume Serial Number is 5256-5E19

Directory of C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests

03/19/2017  07:18 PM    <DIR>          .
03/19/2017  07:18 PM    <DIR>          ..
08/31/2016  10:35 PM                549 project.json
08/31/2016  10:35 PM                195 Tests.cs
               2 File(s)                744 bytes
               2 Dir(s) 145,029,070,848 bytes free

C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests>
```

```
C:\WINDOWS\system32\cmd.exe
C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests>dotnet test
Project StringLibraryTests (.NETCoreApp,Version=v1.0) will be compiled because expected outputs are missing
Compiling StringLibraryTests for .NETCoreApp,Version=v1.0
C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests\project.json(9,46): warning NU1007:
  Dependency specified was dotnet-test-xunit >= 1.0.0-rc2-192208-24 but ended up with dotnet-test-xunit 1.0.0-rc2-build10015.

Compilation succeeded.
    1 Warning(s)
    0 Error(s)

Time elapsed 00:00:00.0658248

xUnit.net .NET CLI test runner (64-bit win10-x64)
  Discovering: StringLibraryTests
  Discovered:  StringLibraryTests
  Starting:    StringLibraryTests
  Finished:    StringLibraryTests
=== TEST EXECUTION SUMMARY ===
   StringLibraryTests  Total: 1, Errors: 0, Failed: 0, Skipped: 0, Time: 0.113s
SUMMARY: Total: 1 targets, Passed: 1, Failed: 0.

C:\Users\Muhammad.Waqas\Documents\Visual Studio 2015\Projects\FirstApp\test\StringLibraryTests>
```