# OVERVIEW OF THE TECHNICAL ASSIGNMENT

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# **Technical Assignment**

Created the Console application to implement the technical assignment. Details about the attached solution are described in this document.

# Solution:

The solution has three projects.

- 1- CWTechnicalAssignment
- 2- CWTechnicalAssignmentTest
- 3- CWCommandLine

## 1. CWTechnicalAssignment

CWTechnicalAssignment.csproj is a .net core web api project.

This project has one exposed API, with two functions GET and POST. Get Method returns a string and POST Method takes string parameter to be saved in the backend storage. The POST method was added to meet the future requirement where data could be written to a backend storage of choice (database/Console app etc)

```
ValuesController.cs → X CWTechnicalAssignment
CWTechnicalAssignment
                                                            - CWTechnicalAssignment.Controllers.ValuesController
              using System.Collections.Generic;
             using System.Linq;
using System.Threading.Tasks;
using Microsoft.AspNetCore.Mvc;
            using CWTechnicalAssignment.Data;
           □ namespace CWTechnicalAssignment.Controllers
                 [Route("api/[controller]")]
    11
                  nublic class ValuesCont
    13
                      private IHelloWorldRepository helloWorldRepository;
     14
15
                      public ValuesController(IHelloWorldRepository injectedHelloWorldRepository)
                          helloWorldRepository = injectedHelloWorldRepository;
                      // GET api/values
    21
                      public string Get()
    24
25
                          var returnMessage = helloWorldRepository.GetMessage();
                          //Validate Good Reponse from the Repository
                          if (returnMessage == null || returnMessage.Length == 0)
```

#### **Dependency Injection**

One of the requirement of the project for future extensibility was the ability to choose backend storage for saving or reading data, which I implemented using configuration file.

I achieved the goal using ASP.NET Core dependency injection as follows:

#### Repository

I created a repository Interface which defines what should be the interaction with the any data store. It is a following.

```
IHelloWorldRepository.cs ⇒ × launchSettings.json
                                                               appsettings.Development.jso
                                                                                                                                             ▼ ₽ >
CWTechnicalAssignment
                                   Search Solution Explorer (Ctrl+;)
            using System.Collections.Generic;
            using System.Linq;
                                                                                                                      Connected Services
           using System.Threading.Tasks;

    □ Dependencies

                                                                                                                      Properties
          □ namespace CWTechnicalAssignment.Data

    wwwroot
    wwwroot
    www.

            {
                                                                                                                      Controllers
                public interface IHelloWorldRepository
                                                                                                                      Data
                                                                                                                      C# DataBaseHelloWorldReposito
                    string GetMessage();
    10
     11
                                                                                                                         C# FileHelloWorldRepository.cs
                    bool SaveResponse(string response);
    12
                                                                                                                      C* IHelloWorldRepository.cs
    13
           }
                                                                                                                         C# StaticHelloWorldRepository.
    14

    ∏ appsettings.json
```

Then used this Repository in StaticHelloWorldRepository.cs, as following

```
StaticHelloWorldRepository.cs - X IHelloWorldRepository.cs
                                                         launchSettings.ison
                                                                                                                      Solution Explore
CWTechnical Assignment
                                       🔩 CWTechnicalAssignment.Data.StaticHello\ 🕶 🍳 GetMessage()
                                                                                                                       © ○ A A - To - 5 A A
           ⊡using System;
                                                                                                                  ‡
                                                                                                                       Search Solution Explorer (Ctrl+;)
                                                                                                                                                        ρ.
             using System.Collections.Generic;
             using System.Ling;
                                                                                                                             Connected Services
            using System.Threading.Tasks;

■ Dependencies

                                                                                                                            Properties
           namespace CWTechnicalAssignment.Data

⊕ wwwroot

                                                                                                                             Controllers
                 public class StaticHelloWorldRepository : IHelloWorldRepository
                                                                                                                            Data
                                                                                                                            ▶ C# DataBaseHelloWorldReposito
     10
                     public string GetMessage()
    11
                                                                                                                               C# FileHelloWorldRepository.cs
                         return "Hello World":
    12
                                                                                                                               C# IHelloWorldRepository.cs
    13
                                                                                                                             C# StaticHelloWorldRepository.
                                                                                                                          ▶ ■ appsettings.json
    15
                     public bool SaveResponse(string response)
    16
                                                                                                                       Solution Explorer Team Explorer
                         if (response == null || response.Length == 0)
    18
                             return false:
                                                                                                                                                     + 1 ×
                         //Assume we got Informatoin
    19
                         return true;
    21
                                                                                                                       22
    23
```

Other implementations of this interface can also be implemented in future as needed. For example – FileHelloWorldRepository, DataBaseHelloWorldRepository.

# The Configuration

Inorder for application to use one of the repository, I have created startup.cs(ASP.Net core inbuilt DI). It also has partial class startup.DI.cs in the project. It has a function to define our Dependency Injection configuration i.e. to choose which repository to use (IHelloWorldRepository). This function is called from the configureServices method in the startup.cs class as following.

```
Startup.cs → × Startup.Dl.cs
                                                                                                      Static Hello World Repository.cs\\
© CWTechnicalAssignment → CWTechnicalAssignment.Startup

    ▼ ConfigureServices(IServiceCollection services)

                                                                                                                                                   ○ ○ ☆ <sup>□</sup> - ○ · · □
     12
                                                                                                                                                   Search Solution Explorer (Ctrl+:)
                                                                                                                                                         Connected Services
    14
                                                                                                                                                         Dependencies
     15
                      public Startup(IHostingEnvironment env)
                                                                                                                                                         Properties
     16

⊕ wwwroot

                           var builder = new ConfigurationBuilder()
                                .SetBasePath(env.ContentRootPath) .AddJsonFile("appsettings.json", optional: false, reloadOnChange: true)
                                                                                                                                                         Controllers
     19
                                                                                                                                                        Data
                                .AddJsonFile($"appsettings.{env.EnvironmentName}.json", optional: true)
                                                                                                                                                        C# DataBaseHelloWorldR
     21
                                AddEnvironmentVariables();
                                                                                                                                                            C# FileHelloWorldReposit
     22
                          Configuration = builder.Build();
                                                                                                                                                           C# IHelloWorldRepository
    23
                                                                                                                                                        ▶ C# StaticHelloWorldRepo
     24
                                                                                                                                                       appsettings.json
    25
                      public IConfigurationRoot Configuration { get; }
                                                                                                                                                         C# Program.cs
     26
27
                      // This method gets called by the runtime. Use this method to add services to the container.

▲ C# Startup.cs

                      public void ConfigureServices(IServiceCollection services)
                                                                                                                                                         C# Startup.Dl.cs
    29
                                                                                                                                                        30
31
                           // Add framework services.
                                                                                                                                                      C# CWTechnicalAssignmentTest
                           services.AddMvc():
                           //Add Custome Services
                                                                                                                                                  Solution Explorer Team Explorer
     33
                           ConfigureCustomServices(services);
     34
35
     37
                      // This method gets called by the runtime. Use this method to configure the HTTP request pipeline. public void Configure(IApplicationBuilder app, IHostingEnvironment env, ILoggerFactory)
                                                                                                                                                  39
                           loggerFactory.AddConsole(Configuration.GetSection("Logging"));
     41
                           loggerFactory.AddDebug();
                           app.UseMvc();
     43
    45
```

#### Using the Repository

The final step in completing the Dependency Injection is using it in the controller tier. A public constructor in Values Controller (OUR Web API controller method) is added and got the implementation from ASP.NET core DI infrastructure based upon the configuration defined above as following:

```
ValuesController.cs → ×
CWTechnicalAssignment
                                          🕶 🔩 CWTechnicalAssignment.Controllers.ValuesContro 🕶 😥 ValuesController(IHelloWorldRepository injectedH 🕶
                                                                                                                                         G O A 🛱 - 🖰 - 5 🗗
                                                                                                                                         Search Solution Explorer (Ctrl+;)
             using System.Collections.Generic;
            using System.Linq;
using System.Threading.Tasks;
                                                                                                                                               (a) Connected Services

■ Dependencies

             using Microsoft.AspNetCore.Mvc;
                                                                                                                                               Properties
            using CWTechnicalAssignment.Data;

⊕ wwwroot

                                                                                                                                               Controllers
               mespace CWTechnicalAssignment.Controllers
                                                                                                                                            ▶ C# ValuesController.cs
                                                                                                                                            Data
                [Route("api/[controller]")]
    11
                public class ValuesController : Controller
                                                                                                                                                 C# DataBaseHelloWorldR
    12
                                                                                                                                                 C# FileHelloWorldReposit
    13
                     private IHelloWorldRepository helloWorldRepository;
                                                                                                                                                 C# IHelloWorldRepository
    14
15
                                                                                                                                                 C# StaticHelloWorldRepo
                        lic ValuesController(IHelloWorldRepository injectedHelloWorldRepository)
                                                                                                                                            16
17 👨
                                                                                                                                               C# Program.cs
                          nelloWorldRepository = injectedHelloWorldRepository;
                                                                                                                                               C# Startup.cs
                                                                                                                                                 C# Startup.Dl.cs
    19
                     // GET api/values
                                                                                                                                              ▶ ★ Startup
    21
    22
                     public string Get()
                                                                                                                                        Solution Explorer Team Explorer
    23
                         var returnMessage = helloWorldRepository.GetMessage();
    25
                         //Validate Good Reponse from the Repository
    27
                         if (returnMessage == null || returnMessage.Length == 0)
                                                                                                                                        28
    29
                             return "Error";
    30
    31
    32
                         return returnMessage:
    33
    34
```

The API controller then calls functions on the local helloworldRepository object of IHelloWorldRepository interface. Based upon our configuration it could be Static File, Database, etc. The API controller is seemless of the approach.

# 2. CWTechnicalAssignmentTest

This is the project for unit test various functions of our Web API controller. Following are the tests:

```
/aluesControllerTests.cs → × DataBaseHelloWorldRe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Solution Explore
C# CWTechnicalAssignmentTest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ○ ○ ☆ ☆ · □ · □ · □ · □
                                                         using Microsoft.VisualStudio.TestTools.UnitTesting;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Search Solution Explorer (Ctrl+;)
                                                                            space CWTechnicalAssignmentTest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ⊕ www.root
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Controllers
                                                                            [TestClass]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ▶ C# ValuesController.cs
                                                                            public class ValuesControllerTests
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Data
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C# FileHelloWorldReposit
                                                                                                public void TestInitilization()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C# IHelloWorldRepositor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C# StaticHelloWorldRepo
                     11
                                                                                                               CWTechnicalAssignment.Controllers.ValuesController valuesController = new CWTechnicalAssignment.Controllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesControllers.ValuesContro
                                                                                                                  Assert.IsNotNull(valuesController);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    appsettings.json
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C* Program.cs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C# Startup.cs
                                                                                             [TestMethod]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ▶ C# Startup.Dl.cs
                     16
17
                                                                                             public void TestGet()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C# CWTechnicalAssignmentTest
                                                                                                               CWTechnicalAssignment.Controllers.ValuesController valuesController = new CWTechnicalAssignment.Controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controller.controlle
                     18
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     □ Dependencies
                     20
21
                                                                                                                 Assert.AreEqual("Hello World", result);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Solution Explorer Team Explore
                       23
                                                                                             [TestMethod]
                                                                                                public void TestPost()
                     26
27
                                                                                                                 CWTechnicalAssignment.Controllers.ValuesController valuesController = new CWTechnicalAssignment.Control
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28
                                                                                                               valuesController.Post("Hi");
Assert.IsNotNull(valuesController);
                       29
30
31
32
```

### 3. The Console Application

The third and final application is the console project. It is an simple asp.net console project which makes a call to our web api project and prints the output in a console window. Code is as following

```
Program.cs ≠ ×
                                                                                                      → 🔍 Main(string[] args)
                                                 🕶 🐾 CWCommandLine.Program
CWCommandLine
                                                                                                                                                                ○ ○ ☆ ☆ · □ · □ · □
             using System.Threading.Tasks;
                                                                                                                                                                Search Solution Explorer (Ctrl+;)
            □ namespace CWCommandLine
                                                                                                                                                                Solution 'CWTechnicalAssignme
                                                                                                                                                                class Program
                                                                                                                                                                   Dependencies
                                                                                                                                                                   C# Program.cs
                        private const string APIURL = "http://localhost:50660/";
static void Main(string[] args)
                                                                                                                                                                   CWTechnicalAssignment
    11
12
                                                                                                                                                                      Connected Services
                            //console.WriteLine("Hello World!");
var messageFromApi = GetMessageFromApI().Result;
                                                                                                                                                                      .:: Dependencies
    13
14
15
16
17
18
                                                                                                                                                                      Properties
                            Console.WriteLine(messageFromApi);
                                                                                                                                                                       ⊕ www.root
                                                                                                                                                                      Controllers
                            //Wait for Key press to give oppetunity to read the message from API Console.ReadLine();
                                                                                                                                                                      ▶ C# ValuesController.cs
                                                                                                                                                                   Data
    19
20
21
22
                                                                                                                                                                      ▶ C# DataBaseHelloWorldR
                        private static async Task<string> GetMessageFromAPI()
                                                                                                                                                                         C* FileHelloWorldReposit
                                                                                                                                                                      C* IHelloWorldRepository
                             var client = new HttpClient();
                            Client.DefaultRequestHeaders.Accept.Clear();
var stringTask = client.GetStringAsync($"{APIURL}/api/values");
var msg = await stringTask;
return msg;
                                                                                                                                                                         C# StaticHelloWorldRepo
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                                                                                                                                                                      Þ
                                                                                                                                                               Solution Explorer Team Explorer
```

#### Output is shown below:

