

Worksheet 1**Introduction to .NET in Visual Studio 2019****Included Topics:**

- .NET Conventions
- Visual Studio Solutions / Projects
- Class Libraries
- Databases

©2020: {rui.ferreira, marisa.maximiano, ricardo.p.gomes, nuno.reis}@ipleiria.pt

1. Visual Studio Solutions / Projects

The following exercises will approach the various basic concepts needed to work with Visual Studio Projects in C#.

Exercises

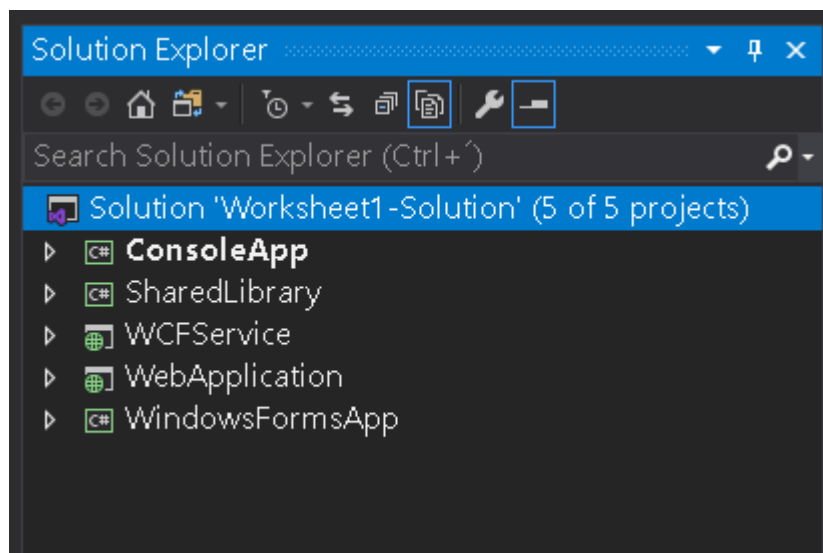
1. Check if the following software and tools are installed on your development machine:
 - a) Visual Studio 2019:
 - i. ASP.Net and Web Tools 2019¹ (16.4.460.23317);
 - ii. SQL Server Data Tools (>= 16.0.61912.09160);
 - b) Citizen Card Software²;
 - c) CACert's root certificate³.
2. While waiting to finish the installation it is important to know the basic convention rules of the selected framework (.NET) and programming language (C#). To check this, you should read the document ".NET Conventions | Basic rules to program in .NET".

¹ To check this, go to Help – About Visual Studio

² <https://www.autenticacao.gov.pt/cc-software>

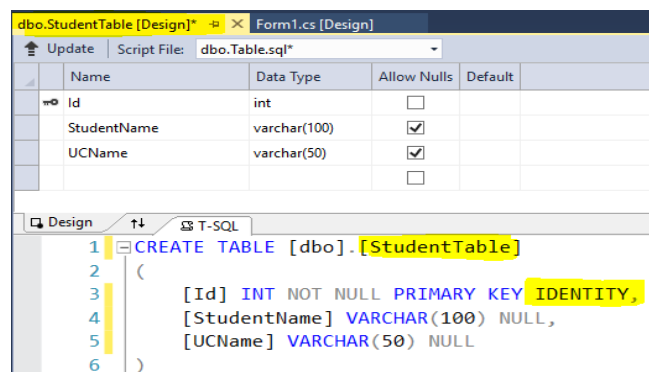
³ <http://www.cacert.org/index.php?id=3>

3. Create a new Project in Visual Studio with the following criteria:
 - a) Solution Name: *Worksheet1-Solution*;
 - b) Project Type: *Console App (.NET Framework)*;
 - c) Project Name: **ConsoleApp**.
4. Take a moment to open the file explorer to the solution's folder and understand the created structure. To do this you may right-click on the Solution name and choose the option "Open in File Explorer".
5. Add a new Project to the existing Solution with the following criteria. To add this new project right-click the Solution name and choose "Add – New Project":
 - a) Project Type: *Class Library (.NET Framework)*;
 - b) Project Name: **SharedLibrary**.
6. Add a new Project to the existing Solution with the following criteria. To add this new project right-click the Solution name and choose "Add – New Project":
 - a) Project Type: WCF Service Application (C#)
 - b) Project Name: **WCFSERVICE**
7. Import the supplied projects⁴ into the existing solution:
 - a) Right-clicking the Solution name and choose "Add – Existing Project";
 - b) Choose the appropriate ".csproj" files from the project folders;
 - c) The Layout of the solution should be like the following image:



⁴ Download from the class page in <http://ead.ipleiria.pt>

8. Run the Solution by clicking **Start**:
 - a) Notice which project started.
9. Define the **startup Projects** to be all projects except the Shared Library, by the order shown in the previous figure:
 - a) Run the Solution again and check if all relevant projects started properly.
10. Edit the **Shared Library** Project:
 - a) Rename the default class to “SIHelper”;
 - b) Add a simple static method that returns the string “EI.SI 2019” called “GetUCName()”;
 - c) Compile the project and locate the resulting file⁵.
11. Edit the **ConsoleApp** Project:
 - a) Add the Shared Library to the project by using the complied file⁶;
 - b) Write to the console the value returned by the “GetUCName()” method on the “SIHelper” class;
 - c) Make the console wait for some user keyboard input before exiting.
12. Edit the **WindowsFormApp**:
 - a) Add the Shared Library to the Project by choosing the Project (not the complied file);
 - b) Create a **new database** in the Project⁷ called “Worksheet1Database”;
 - c) Add the table “**StudentTable**” to the database with the following structure:



The screenshot shows the SQL Server Enterprise Designer interface. The top pane displays the 'Design' view of the 'dbo.StudentTable' table. The bottom pane displays the 'T-SQL' view, showing the 'CREATE TABLE' script for the table. The table has three columns: 'Id' (int, primary key, identity), 'StudentName' (varchar(100)), and 'UCName' (varchar(50)).

Name	Data Type	Allow Nulls	Default
Id	int	<input type="checkbox"/>	
StudentName	varchar(100)	<input checked="" type="checkbox"/>	
UCName	varchar(50)	<input checked="" type="checkbox"/>	

```

1 CREATE TABLE [dbo].[StudentTable]
2 (
3     [Id] INT NOT NULL PRIMARY KEY IDENTITY,
4     [StudentName] VARCHAR(100) NULL,
5     [UCName] VARCHAR(50) NULL
6 )
  
```

⁵ Right-click the project, Open Folder in File Explorer and navigate to bin/Debug

⁶ Right-click the References section of the project and choose **Add Reference** then select the file in the Browse section

⁷ Right-click the Project – Add – New Item – Data – Service-based Database

- d) Add a connection to the database⁸ and, after that, there should be information like the following image in the “App.config” file of the project:

```

App.config  Form1.cs [Design]
1  <?xml version="1.0" encoding="utf-8" ?>
2  <configuration>
3  <configSections>
4  </configSections>
5  <connectionStrings>
6      <add name="WindowsFormsApp.Properties.Settings.Worksheet1DatabaseConnectionString"
7          connectionString="Data Source=(LocalDB)\MSSQLLocalDB;AttachDbFilename=|DataDirectory|\Worksheet1Database.mdf;
8          providerName="System.Data.SqlClient" />
9  </connectionStrings>
10 <startup>
11 <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.6.1" />
12 </startup>
13 </configuration>

```

and in “Properties – Settings”:

Name	Type	Scope	Value
Worksheet1DatabaseConnectionString	(Connection string)	Application	Data Source=(LocalDB)\MSSQLLocalDB;AttachDbFilename= DataDirectory

- e) Edit the “Form1” to match the following image:

Note: do not forget to change the default object names.

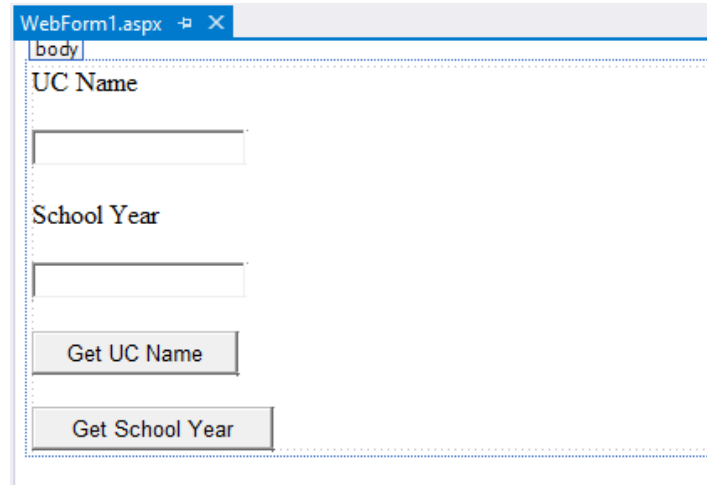
- f) Implement the necessary code on the “Get UC Name” button for using the Shared Library to get the UC name;
- g) Add the “DatabaseHelper” file to the project⁹ (the file is provided on the previous downloaded zip file);
- h) Implement the necessary code on the “Save to Database” button to save the Form’s data to the database as a new record.

⁸ Data Sources Toolbar (if not open View–Other Windows–Data Sources), Add New Data Source and follow the wizard

⁹ Right-click the project – Add – Existing Item

13. Edit the WebApplication project:

- a) Add the SharedLibrary as a dependency by referencing the project;
- b) Add a new WebForm “index.aspx” to the project¹⁰;
- c) Add the following elements to the “index.aspx” form:



The screenshot shows a web browser window with a single tab titled 'WebForm1.aspx'. The page content is as follows:

body

UC Name

School Year

Get UC Name

Get School Year

- d) Set the “index.aspx” as the default start page;
- e) Implement the necessary code to get the UC Name.

14. Edit the Shared Library:

- a) Add a new **property** called “SchoolYear()” that returns the string “2019/20”;
- b) Build the project.

15. Edit the WebApplication:

- a) Check if the new method is available on the Shared Library;
- b) Implement the necessary code to get the current school year.

16. It is time to check if you code follow all the conventions rules of C# language.

¹⁰ Right-click the project – Add – New Item - WebForm