Worksheet 1

Introduction to .NET in Visual Studio 2019

Included Topics:

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

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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 2019[1] (16.8.560.26713);
        ii. SQL Server Data Tools (>= 16.0.62102.01130);
    b) Citizen Card Software[2];
    c) CACert's root certificate[3].
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

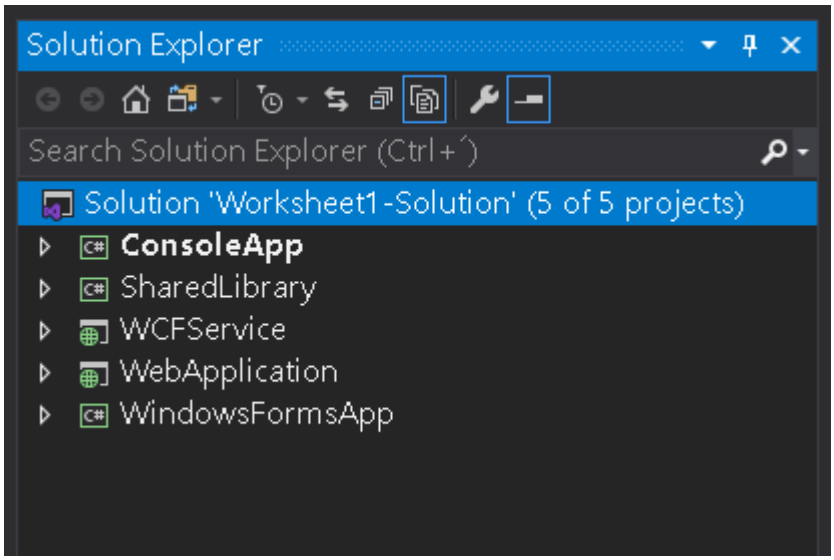
3. Create a new Project in Visual Studio with the following criteria:
    a) Solution Name: *Worksheet1-Solution*;
    b) Project Type: *Console App (.NET Framework)*;
    c) Project Name: ***ConsoleApp***.

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 projects[4] 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

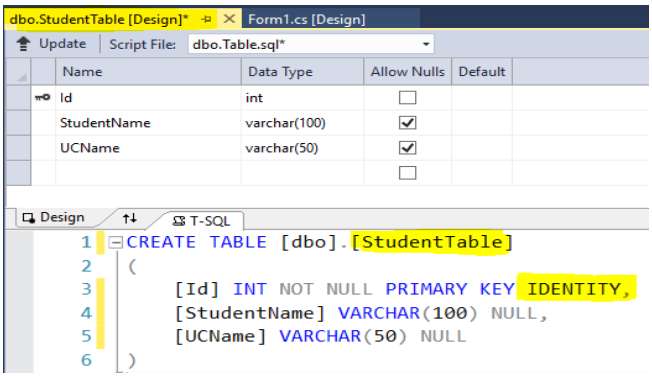
8. Run the Solution by clicking **Start**:
    a) Notice which project started.

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 2020" called "GetUCName()";
    c) Compile the project and locate the resulting file[5].

11. Edit the **ConsoleApp** Project:
    a) Add the Shared Library to the project by using the complied file[6];
    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 compiled file);
    b) Create a **new database** in the Project[7] called "Worksheet1Database";
    c) Add the table "**StudentTable**" to the database with the following structure:



[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

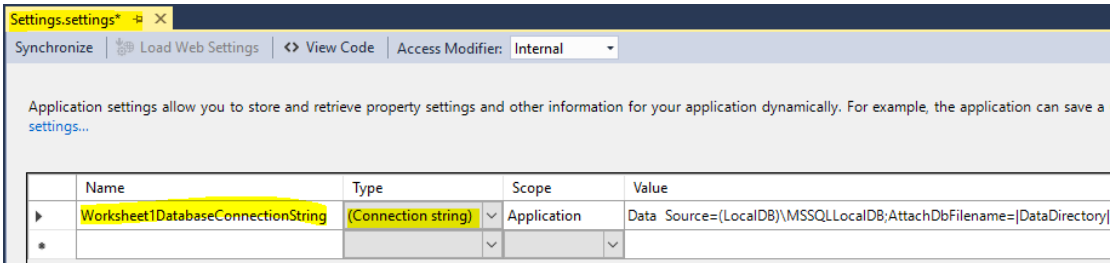
[7] Right-click the Project – Add – New Item – Data – Service-based Database

d) Add a connection to the database[8] and, after that, there should be information like the following image in the "App.config" file of the project:

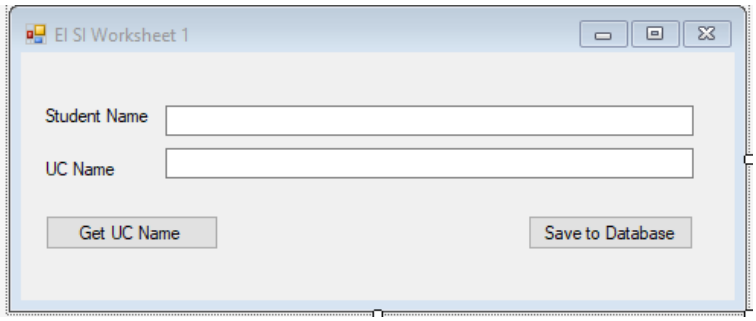
App.config | Form1.cs [Design]

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
    <configSections>
    </configSections>
    <connectionStrings>
        <add name="WindowsFormsApp.Properties.Settings.Worksheet1DatabaseConnectionString"
            connectionString="Data Source=(LocalDB)\MSSQLLocalDB;AttachDbFilename=|DataDirectory|\Worksheet1Database.mdf;
            providerName="System.Data.SqlClient" />
    </connectionStrings>
    <startup>
        <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.6.1" />
    </startup>
</configuration>
```

and in "Properties – Settings":



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 project[9] (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

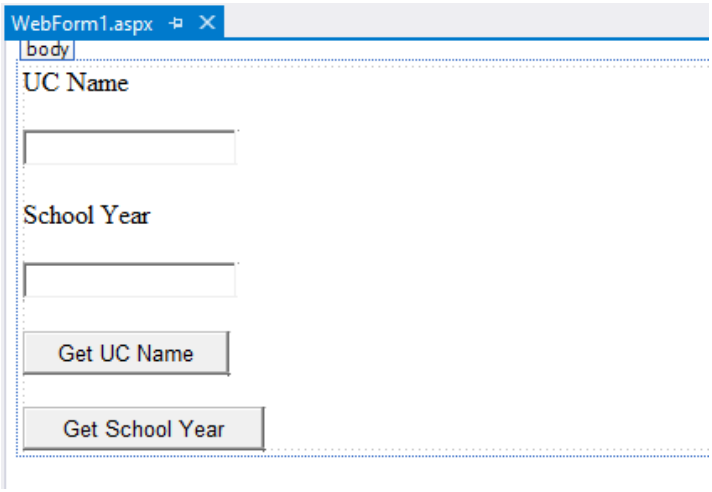
[9] Right-click the project – Add – Existing Item

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 project[10];

    c) Add the following elements to the "index.aspx" form:



    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 "2020/21";

    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