IronXL.Excel Guide

Version 2019.5.2

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Contents

Introduction

<-- Text in introduction part -->

And you can visit https://ironsoftware.com/csharp/excel/ for more information.

You can download sample project from GitHub (https://github.com/magedo93/IronSoftware.git)

Document Organization

- Chapter 1 Install IronXL.Excel: this part describes How to install IronXL.Excel to existing project.
- Chapter 2 Basic Operations: this part describes basic operation with excel create or Open workbook, select sheet, select cell save workbook
- Chapter 3 Advanced Sheet Operations: this part describes how to different manipulation capabilities like adding headers or footers, mathematical operations files, and other features.
- Summery
  brief conclusion about what we have learned in this document
- About author
  brief about document author

Chapter 1: Install IronXL.Excel

IronXL.Excel can be installed and used on all of .NET projects type like windows application, ASP.NET MVC and .Net Core Application.

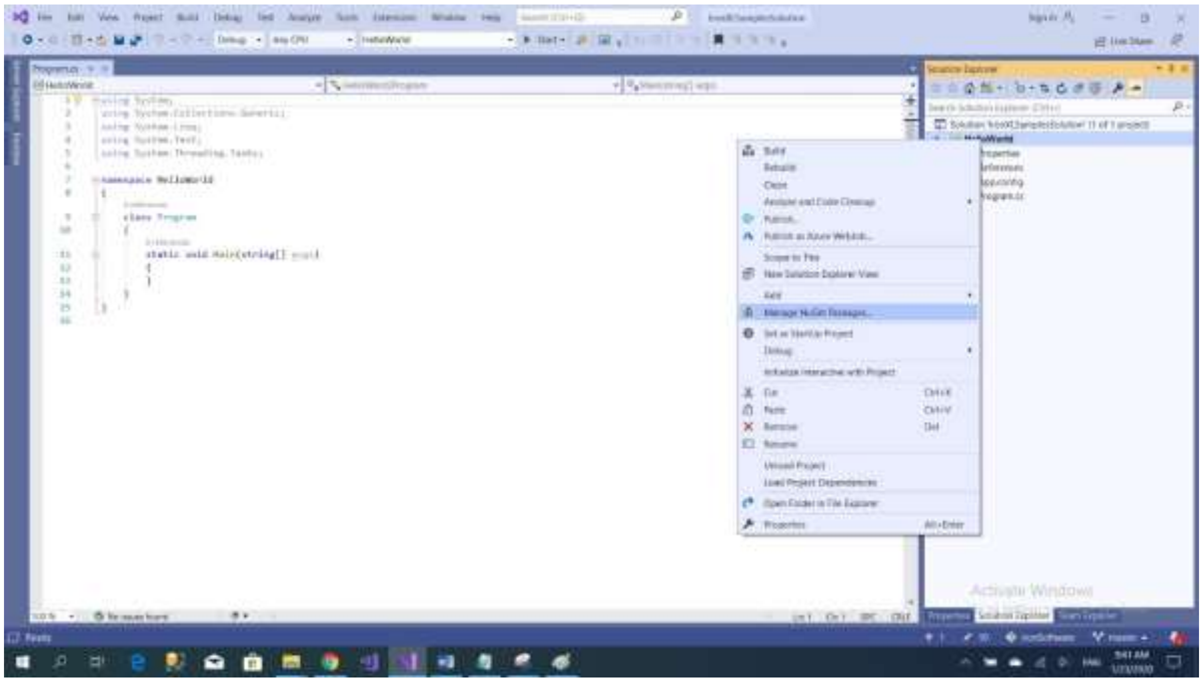
To add IronXL.Excel library to the project we have two ways, from Visual studio editor install using NuGet or command line using package console manager as following: -

Install using NuGet

To add IronXL.Excel library to our project using NuGet we can do it using visualized interface (NuGet Package Manager) or by command using Package Manager Console as following: -

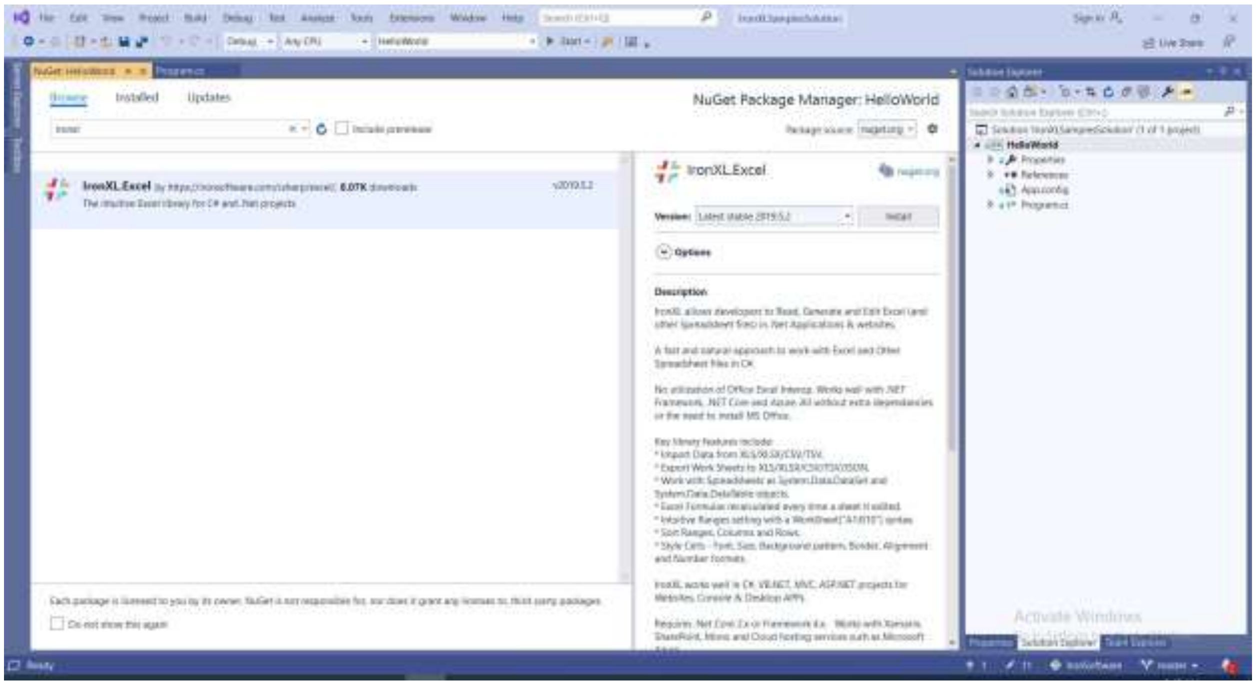
Using NuGet Package Manager

1- Using mouse -> right click on project name -> Select manage NuGet Package



```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace HelloWorld
{
    class Program
    {
        static void Main(string[] args)
        {
        }
    }
}
```

2- From brows tab -> search for IronXL.Excel -> Install



IronXL.Excel by https://ironsoftware.com/csharp/excel/, 8.07K downloads v2019.5.2
The intuitive Excel library for C# and .Net projects

Description

IronXL allows developers to Read, Generate and Edit Excel (and other Spreadsheet files) in .Net Applications & websites.

A fast and natural approach to work with Excel and Other Spreadsheet files in C#.

No utilization of Office Excel Interop. Works well with .NET Framework, .NET Core and Azure. All without extra dependencies or the need to install MS Office.

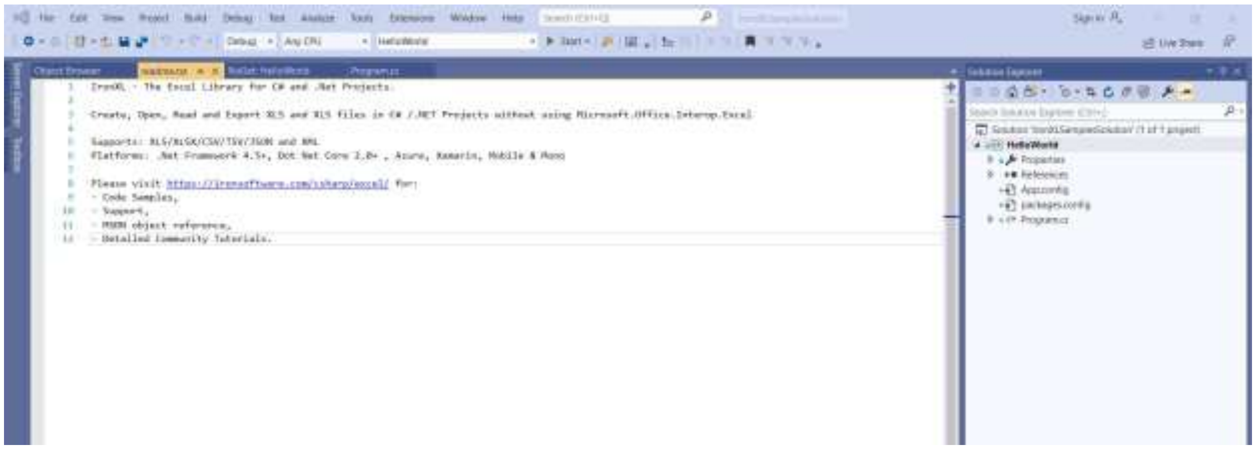
Key library features include:
* Import Data from XLS/XLSX/CSV/TSV.
* Export Work Sheets to XLS/XLSX/CSV/TSV/JSON.
* Work with Spreadsheets as System.Data.DataSet and System.Data.DataTable objects.
* Excel Formulas recalculated every time a sheet it edited.
* Intuitive Ranges setting with a WorkSheet["A1:B10"] syntax.
* Sort Ranges, Columns and Rows.
* Style Cells - Font, Size, Background pattern, Border, Alignment and Number formats.

IronXL works well in C#, VB.NET, MVC, ASP.NET projects for Websites, Console & Desktop APPs.

Requires .Net Core 2.x or Framework 4.x. Works with Xamarin, SharePoint, Mono and Cloud hosting services such as Microsoft

Each package is licensed to you by its owner. NuGet is not responsible for, nor does it grant any licenses to, third-party packages.

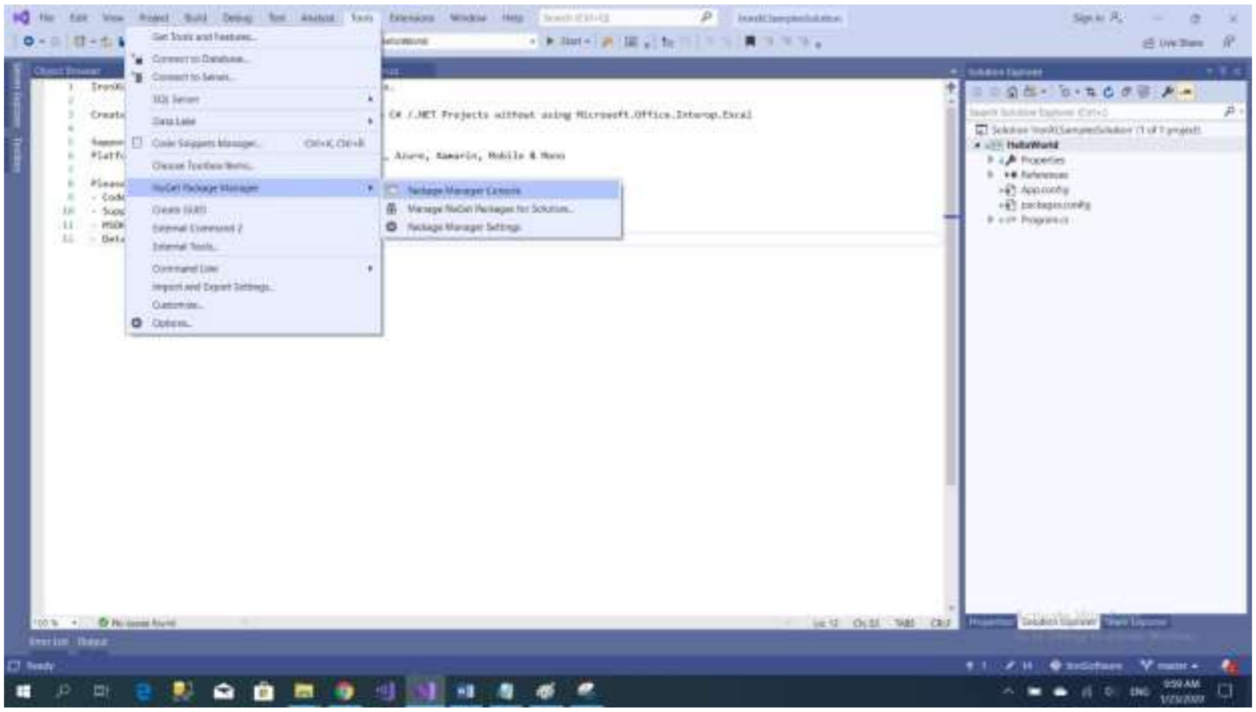
3- And we are Done



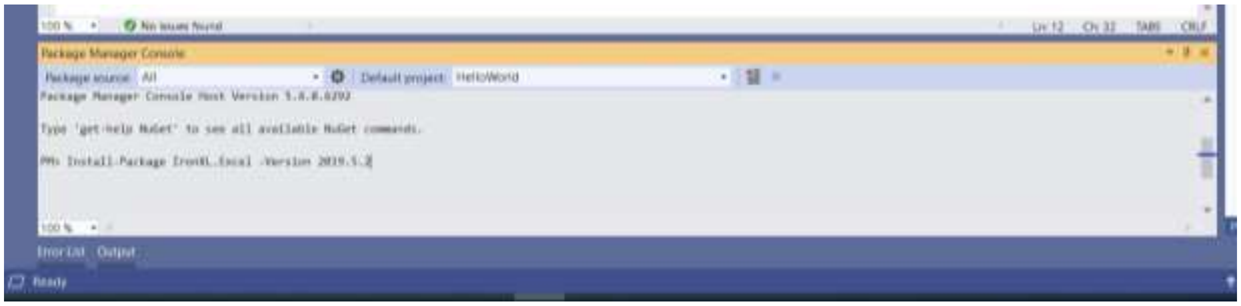
```
IronXL - The Excel Library for C# and .Net Projects.

Create, Open, Read and Export XLS and XLS files in C# /.NET Projects without using Microsoft.Office.Interop.Excel

Supports: XLS/XLSX/CSV/TSV/JSON and XML
Platforms: .Net Framework 4.5+, Dot Net Core 2.0+ , Azure, Xamarin, Mobile & Mono

Please visit https://ironsoftware.com/csharp/excel/ for:
- Code Samples,
- Support,
- MSDN object reference,
- Detailed Community Tutorials.
```

Using NuGet Package Console manager

1- From tools -> NuGet Package Manager -> Package Manager Console



2- Run command -> Install-Package IronXL.Excel -Version 2019.5.2



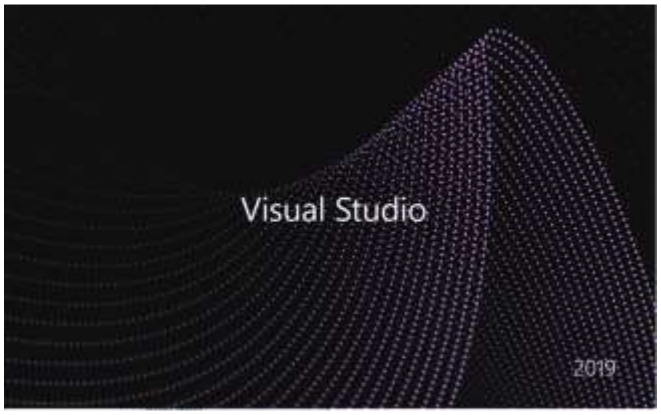
```
Package Manager Console Host Version 5.8.0.6292

Type 'get-help NuGet' to see all available NuGet commands.

PM> Install-Package IronXL.Excel -Version 2019.5.2
```

Chapter 2: Basic Operations

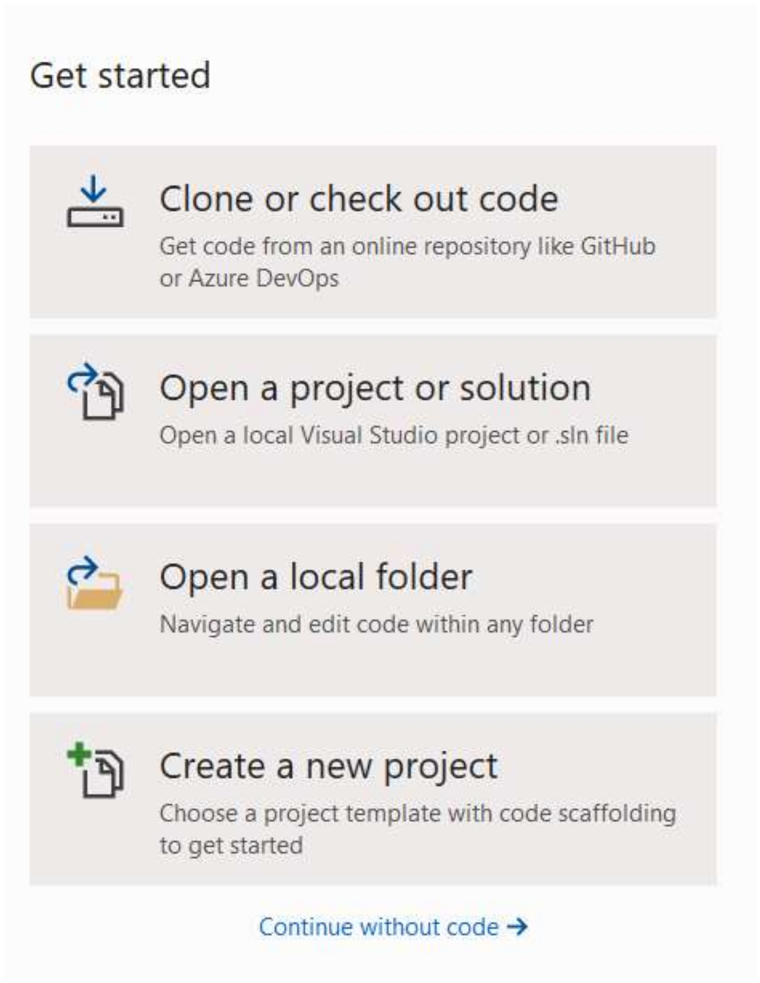
1- Sample: HelloWorld Console Application

Follow coming steps to create HelloWorld Project

1.1. Open visual studio



1.2. Choose Create new project



Get started

Clone or check out code
Get code from an online repository like GitHub or Azure DevOps

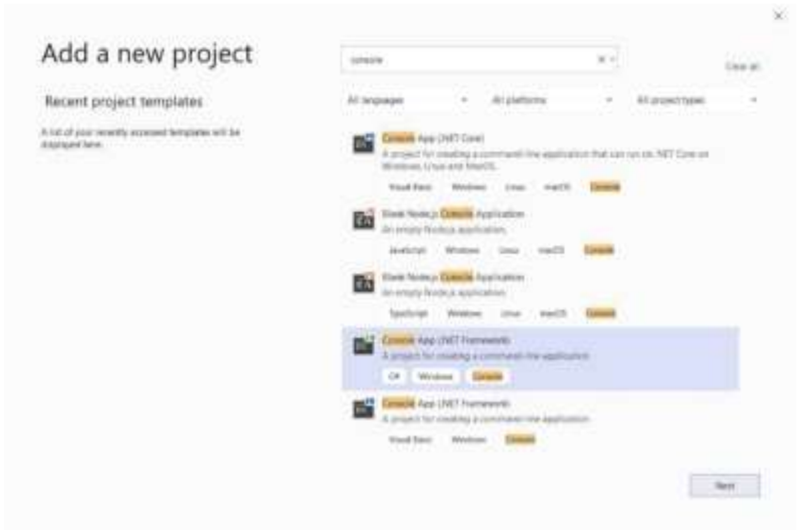
Open a project or solution
Open a local Visual Studio project or .sln file

Open a local folder
Navigate and edit code within any folder

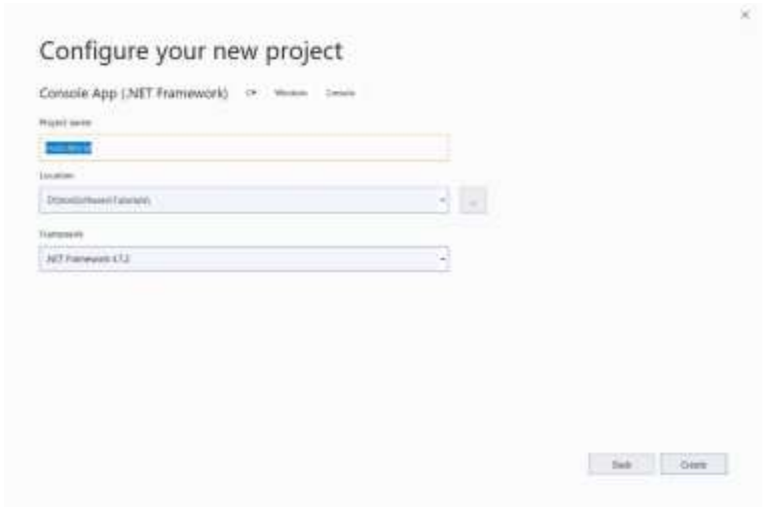
Create a new project
Choose a project template with code scaffolding to get started

Continue without code →

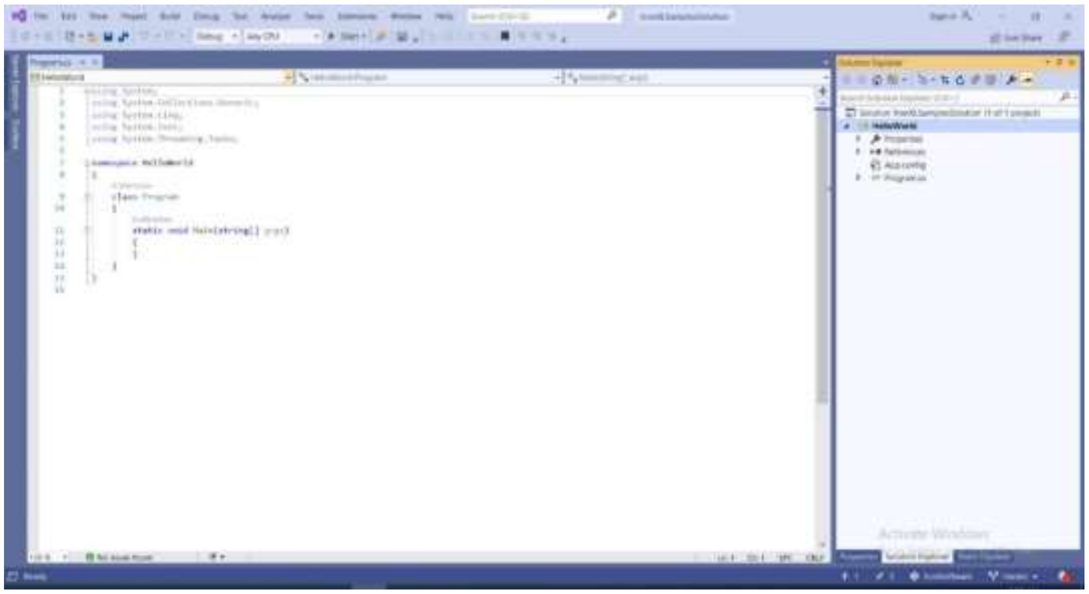
1.3. Choose Console App (.NET framework)



1.4. Give our sample name “HelloWorld” and click create

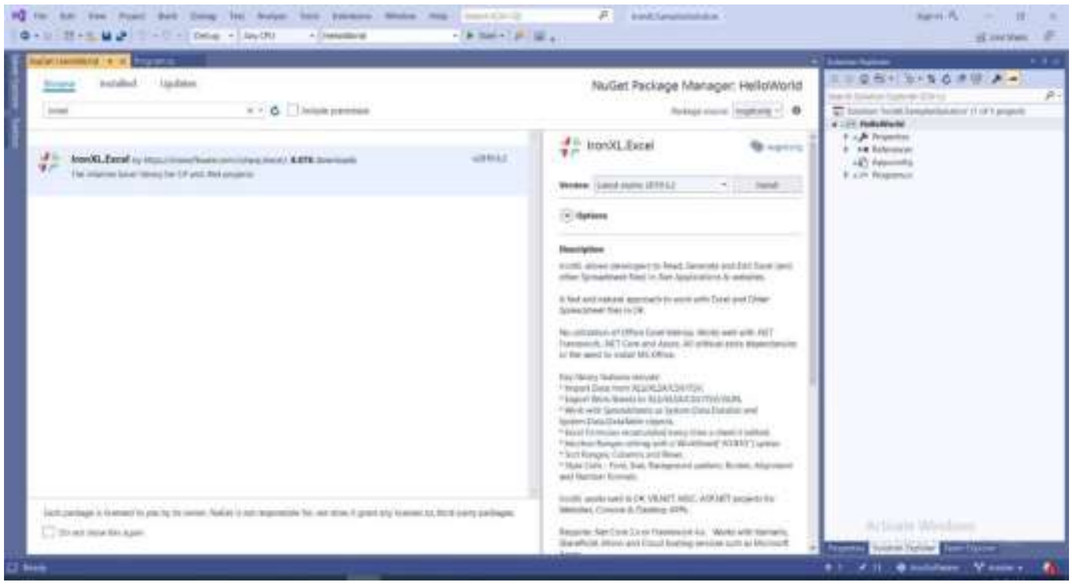


1.5. Now we have console application created



```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace HelloWorld
{
    class Program
    {
        static void Main(string[] args)
        {
        }
    }
}
```

1.6. Add IronXL.Excel => click install



1.7. Add our first few lines that reads 1st cell in 1st sheet in excel file and print it

```
 static void Main(string[] args)
 {
  var workbook =
IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\HelloWorld.xlsx");
  var sheet = workbook.WorkSheets.First();
  var cell = sheet["A1"].StringValue;
  Console.WriteLine(cell);
 }
```

2. Create New Excel File

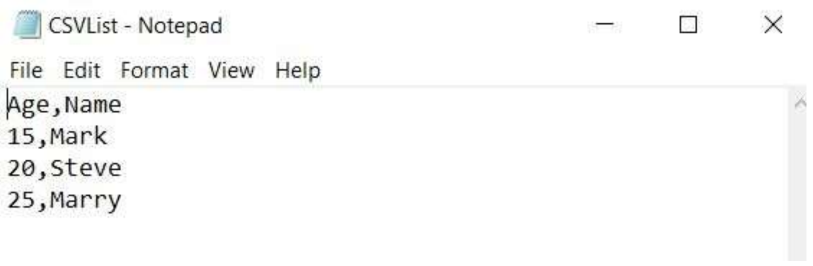
you can create new excel file using IronXL as follow

```
 static void Main(string[] args)
        {
            var newXLFile = WorkBook.Create(ExcelFileFormat.XLSX);
            newXLFile.Metadata.Title = "IronXL New File";
            var newWorkSheet = newXLFile.CreateWorkSheet("1stWorkSheet");
            newWorkSheet["A1"].Value = "Hello World";
            newWorkSheet["A2"].Style.BottomBorder.SetColor("#ff6600");
            newWorkSheet["A2"].Style.BottomBorder.Type =
IronXL.Styles.BorderType.Dashed;
        }
```

3. Open (CSV, XML, JSON List) as Workbook

3.1. Open CSV file

3.1.1. Create new text file and add to its list of names and ages as follow then save it as CSVList.csv



```
Age,Name
15,Mark
20,Steve
25,Marry
```

3.1.2. Code snippet should be like this

```
static void Main(string[] args)
{
 var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\CSVList.csv");
 var sheet = workbook.WorkSheets.First();
 var cell = sheet["A1"].StringValue;
 Console.WriteLine(cell);
}
```

3.2. open XML File

create an XML file that contains countries list as following
root element "countries" that have children elements "country" and each country has properties that define the country like code, continent, etc.

```
 <?xml version="1.0" encoding="utf-8"?>
<countries xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
              <country code="ae" handle="united-arab-emirates" continent="asia"
iso="784">United Arab Emirates</country>
              <country code="gb" handle="united-kingdom" continent="europe" alt="England
Scotland Wales GB UK Great Britain Britain Northern" boost="3" iso="826">United
Kingdom</country>
              <country code="us" handle="united-states" continent="north america" alt="US
America USA" boost="2" iso="840">United States</country>
              <country code="um" handle="united-states-minor-outlying-islands" continent="north
america" iso="581">United States Minor Outlying Islands</country>
</countries>
```

3.3. and now copy the following code snippet that open XML as workbook

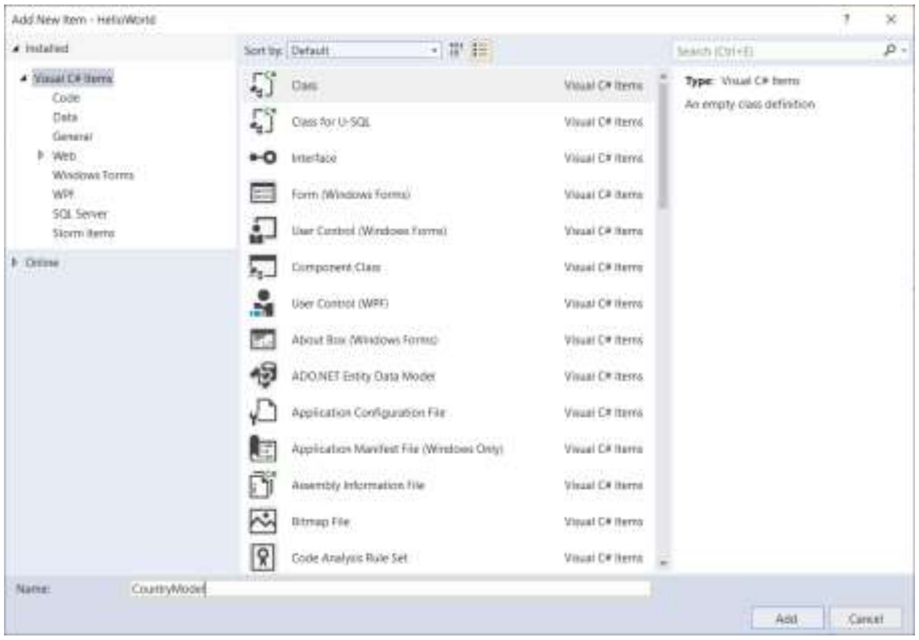
```
static void Main(string[] args)
 {
   var xmldataset = new DataSet();
   xmldataset.ReadXml($@"{Directory.GetCurrentDirectory()}\Files\CountryList.xml");
   var workbook = IronXL.WorkBook.Load(xmldataset);
   var sheet = workbook.WorkSheets.First();
 }
```

3.4. open JSON List as workbook

create JSON country list as following

```
[
  {
    "name": "United Arab Emirates",
    "code": "AE"
  },
  {
    "name": "United Kingdom",
    "code": "GB"
  },
  {
    "name": "United States",
    "code": "US"
  },
  {
    "name": "United States Minor Outlying Islands",
    "code": "UM"
  }
]
```

3.4.1. create country model that will map to JSON



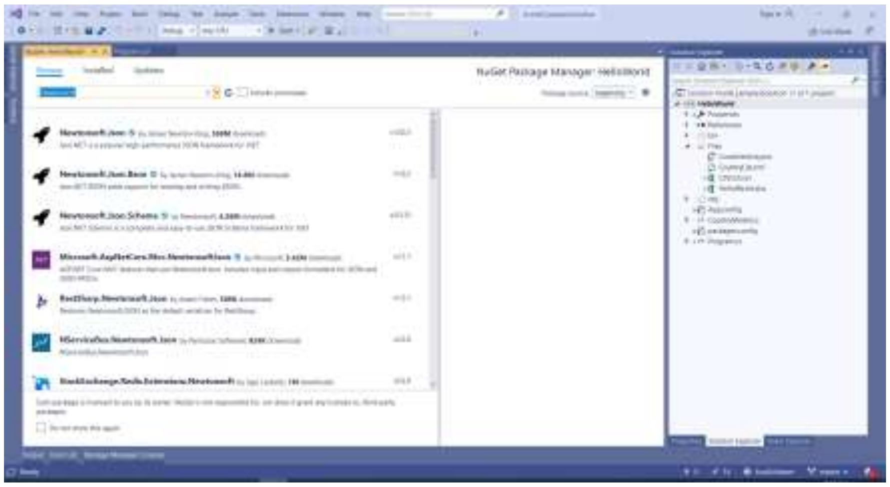
Type: Visual C# Items
An empty class definition

Name: CountryModel

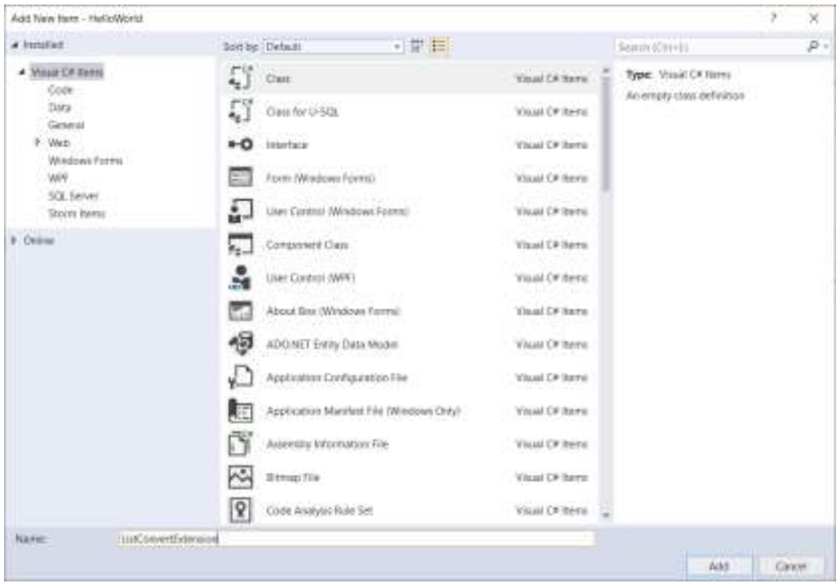
3.4.2. and here is the class code snippet

```
public class CountryModel
    {
        public string name { get; set; }
        public string code { get; set; }
    }
```

3.4.3. Add Newtonsoft library to convert JSON to list of country models



3.4.4. To convert list to dataset we have to create new extension for list as following, first add extension class with the name "ListConvertExtension"



Name: ListConvertExtension

3.4.5. Then add this code snippet to it

```
public static class ListConvertExtension
    {
        public static DataSet ToDataSet<T>(this IList<T> list)
        {
            Type elementType = typeof(T);
            DataSet ds = new DataSet();
            DataTable t = new DataTable();
            ds.Tables.Add(t);

            //add a column to table for each public property on T
            foreach (var propInfo in elementType.GetProperties())
            {
                Type ColType = Nullable.GetUnderlyingType(propInfo.PropertyType) ??
propInfo.PropertyType;

                t.Columns.Add(propInfo.Name, ColType);
            }

            //go through each property on T and add each value to the table
            foreach (T item in list)
            {
                DataRow row = t.NewRow();

                foreach (var propInfo in elementType.GetProperties())
                {
                    row[propInfo.Name] = propInfo.GetValue(item, null) ?? DBNull.Value;
                }

                t.Rows.Add(row);
            }

            return ds;
        }
    }
```

3.4.6. And finally load this dataset as workbook

```
static void Main(string[] args)
        {
            var jsonFile = new
StreamReader($@"{Directory.GetCurrentDirectory()}\Files\CountriesList.json");
            var countryList =
Newtonsoft.Json.JsonConvert.DeserializeObject<CountryModel[]>(jsonFile.ReadToEnd());
            var xmldataset = countryList.ToDataSet();
            var workbook = IronXL.WorkBook.Load(xmldataset);
            var sheet = workbook.WorkSheets.First();
        }
```

4. Save and Export

We can save or export excel file to multiple files formats like (".xlsx",".csv",".html") using one of the following commands.

4.1. Save to ".xlsx"

To Save to ".xlsx" use saveAs function

```
static void Main(string[] args)
        {
            var newXLFile = WorkBook.Create(ExcelFileFormat.XLSX);
            newXLFile.Metadata.Title = "IronXL New File";
            var newWorkSheet = newXLFile.CreateWorkSheet("1stWorkSheet");
            newWorkSheet["A1"].Value = "Hello World";
            newWorkSheet["A2"].Style.BottomBorder.SetColor("#ff6600");
            newWorkSheet["A2"].Style.BottomBorder.Type = IronXL.Styles.BorderType.Dashed;

            newXLFile.SaveAs($@"{Directory.GetCurrentDirectory()}\Files\HelloWorld.xlsx");
        }
```

4.2. Save to csv ".csv"

To save to ".csv" we can use SaveAsCsv and pass to it 2 parameters 1st parameter the file name and path the 2nd parameter is the delimiter like ("," or " | " or ":")

```
newXLFile.SaveAsCsv($@"{Directory.GetCurrentDirectory()}\Files\HelloWorld.csv",delimiter:"|");
```

4.3. Save to JSON ".json"

To save to Json ".json" use SaveAsJson as follow

```
newXLFile.SaveAsJson($@"{Directory.GetCurrentDirectory()}\Files\HelloWorldJSON.json");
```

The result file should be as follow

```
[
  [
    "Hello World"
  ],
  [
    ""
  ]
]
```

4.4. Save to XML ".xml"

To save to xml use SaveAsXml as follow

```
newXLFile.SaveAsXml($@"{Directory.GetCurrentDirectory()}\Files\HelloWorldXML.XML");
```

Result should be like the following

```
<?xml version="1.0" standalone="yes"?>
<_x0031_stWorkSheet>
  <_x0031_stWorkSheet>
    <Column1 xsi:type="xs:string" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">Hello World</Column1>
  </_x0031_stWorkSheet>
  <_x0031_stWorkSheet>
    <Column1 xsi:type="xs:string" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" />
  </_x0031_stWorkSheet>
</_x0031_stWorkSheet>
```

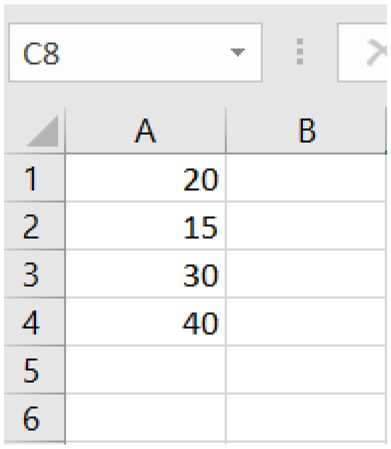
Chapter 3: Advanced Sheet Operations

In this chapter we will go throw common excel functions like (SUM, AVG, Count)

I'll write short code snippets for each function Let's go.

1- Sum Example

Let's find the sum for this list, I created excel file and named it "Sum.xlsx" and add this list of numbers manually



	A	B
1	20	
2	15	
3	30	
4	40	
5		
6		

```
var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            decimal sum = sheet["A2:A4"].Sum();
            Console.WriteLine(sum);
```

2- AVG Example

Using same file, we can get the average as follow: -

```
   var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            decimal avg = sheet["A2:A4"].Avg();
            Console.WriteLine(avg);
```

3- Count Example

Using same file, we can get the number of elements in a sequence as follow: -

```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            decimal count = sheet["A2:A4"].Count();
            Console.WriteLine(count);
```

4- Max Example

Using same file, we can get max value of range of cells as follow:

```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            decimal max = sheet["A2:A4"].Max ();
            Console.WriteLine(max);
```

– we can apply transform function to the result of max function as follow:

```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            bool max2 =sheet["A1:A4"].Max(c => c. IsFormula);
            Console.WriteLine(count);
```

This example write “false” in the console.

5- Min Example

Using same file, we can get min value of range of cells as follow

```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            bool max2 =sheet["A1:A4"].Min();
            Console.WriteLine(count);
```

6- Order cells Example

Using same file, we can order cells ascending or descending as follow

```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            sheet["A1:A4"].SortAscending(); //or use > sheet["A1:A4"].SortDescending(); to
order descending
            workbook.SaveAs("SortedSheet.xlsx");
```

7- If Condition Example

Using same file, we can use Formula property to set or get cell's formula.

4.1 – Set Cell's Formula as follow:

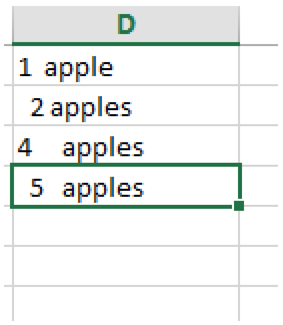
```
     var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\Sum.xlsx");
            var sheet = workbook.WorkSheets.First();
            int i = 1;
            foreach(var cell in sheet["B1:B4"])
            {
                cell.Formula = "=IF(A" +i+ ">=20,\" Pass\" ,\" Fail\" )";
                i++;
            }
            workbook.SaveAs($@"{Directory.GetCurrentDirectory()}\Files\NewExcelFile.xlsx");
```

4.2 – using the generated file form the previous example, we can get Cell's Formula as follow:

```
     var workbook =
IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\NewExcelFile.xlsx");
            var sheet = workbook.WorkSheets.First();
            foreach(var cell in sheet["B1:B4"])
            {
                Console.WriteLine(cell.Formula);
            }
            Console.ReadKey();
```

8- Trim Example

To apply trim function (to eliminate all extra spaces in cells) I added this column to the sum.xlsx file



D
1 apple
2 apples
4   apples
5 apples

And use this code

```
     var workbook = 
IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\NewExcelFile.xlsx");
            var sheet = workbook.WorkSheets.First();
            int i = 1;
            foreach (var cell in sheet["f1:f4"])
            {
                cell.Formula = "=trim(D"+i+")";
                i++;
            }
workbook.SaveAs("editedFile.xlsx");
```

Thus, you can apply formulas in the same way

Chapter 4: Working with workbooks contains more than one sheet

In this chapter we will go through how to work with workbook that have more than one sheet

1- Read Data from multiple sheets in the same workbook

I created xlsx file contains two sheets "Sheet1"," Sheet2"

Till now we use WorkSheets.First() to work with the first sheet, this example to specify sheet name and work with it

```
var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\testFile.xlsx");
             WorkSheet sheet = workbook.GetWorkSheet("Sheet2");
            var range = sheet["A2:D2"];
            foreach(var cell in range)
            {
                Console.WriteLine(cell.Text);
            }
```

2- Add New Sheet to a workbook

We can also add new sheet to a workbook as below

```
var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\testFile.xlsx");
              var newSheet = workbook.CreateWorkSheet("new_sheet");
            newSheet["A1"].Value = "Hello World";
            workbook.SaveAs(@"F:\MY WORK\IronPackage\Xl tutorial\newFile.xlsx");
```

Chapter 5: Integration with EF/Database

Let's see how to export/ import data to/from Database

I created TestDb database that contains Country table with two columns Id (int, identity), CountryName(string)

1- Fill Excel sheet with data from Database

Here we will create new sheet and fill it with data from Country Table

```
TestDbEntities dbContext = new TestDbEntities();
var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\testFile.xlsx");
            WorkSheet sheet = workbook.CreateWorkSheet("FromDb");
            List<Country> countryList = dbContext.Countries.ToList();
            sheet.SetCellValue(0, 0, "Id");
            sheet.SetCellValue(0, 1, "Country Name");
            int row = 1;
            foreach (var item in countryList)
            {
                sheet.SetCellValue(row, 0, item.id);
                sheet.SetCellValue(row, 1, item.CountryName);
                row++;
            }
            workbook.SaveAs("FilledFile.xlsx");
```

2- Fill Database with data from Excel sheet

In this example we will insert data to Country table in TestDb Database

```
TestDbEntities dbContext = new TestDbEntities ();
var workbook = IronXL.WorkBook.Load($@"{Directory.GetCurrentDirectory()}\Files\testFile.xlsx");
            WorkSheet sheet = workbook.GetWorkSheet("Sheet3");
            System.Data.DataTable dataTable = sheet.ToDataTable(true);
            foreach (DataRow row in dataTable.Rows)
            {
                Country c = new Country();
                c.CountryName = row[1].ToString();
                dbContext.Countries.Add(c);
            }
            dbContext.SaveChanges();
```

Summary

In this tutorial, we have learned how to (create, open, save) excel file using different ways and also we learned the basic operations that we can do on the file like getting (Sum, Avg., Count)

Author

Ahmed Aboelmagd is a Full-stack experienced software engineer with 12+ years' experience in IT and Software development, delivered 15+ successful project in many size scales from small to an enterprise for industries like (tourism, educational, manufacturing, etc.)

Code Samples prepared by Alaa Mohamed Nagih