Lab 1 – Hello World: Project Setup

Create your first AutoCAD managed application

In this lab, we will use Visual Studio .NET and create a new Class Library project. This project will create a .NET dll that can be loaded into AutoCAD which will add a new command to AutoCAD named "HelloWorld". When the user runs the command, the text "Hello World" will be printed on the command line.

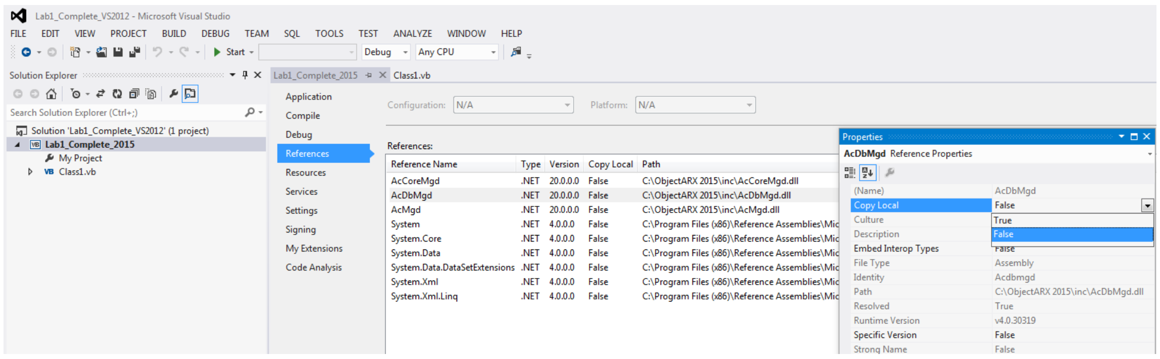
- Launch Visual Studio 2012 and then select File> New> Project. In the New Project dialog select Visual Basic Projects for the Project Type. Select "Class Library" template. Make the name "Lab1" and set the location where you want the project to be created. Select ok to create the project

- If the solution explorer is not visible in visual studio, you may turn it on by going to "View" menu and selecting "Solution Explorer". This view will allow us to browse through files in the project and add references to managed or COM Interop assemblies. Open Class1.vb that was added by the NET wizard by double-clicking on it in the solution explorer.

Connect to the AutoCAD Managed API – AcMgd.dll, AcDbMgd.dll, AcCoreMgd.dll

- In Class1.vb notice that a public class "Class1" was automatically created. We will add our command to this class. To do this we need to use classes in the AutoCAD .NET managed wrappers. These wrappers are contained in two managed modules. To add references to these modules:

    a. Right click on the Project in solution explorer and select "Add Reference".
    b. In the "Add Reference" dialog select "Browse".
    c. In the "Select Component" dialog navigate to the AutoCAD 2012 directory. (C:\Program Files\Autodesk\AutoCAD 2012\) Find "acdbmgd.dll" and select open. Click "Browse" again then find and open "acmgd.dll" and "accoremgd.dll". You can also type *mgd.dll to filter for the required assemblies.
    d. Click ok in the "Add Reference" dialog once these components are selected.
    e. Right click on the Project (Lab1) and select Properties. In the properties dialog select references. Notice that acmgd.dll and acdbmgd.dll are referenced.
    f. Double click on one of these references to launch the properties for the dll.
    g. Change the Copy Local setting to false. (If this copy local is true then the dll does not load properly when debugging).


Lab1_Complete_VS2012 - Microsoft Visual Studio
FILE EDIT VIEW PROJECT BUILD DEBUG TEAM SQL TOOLS TEST ANALYZE WINDOW HELP
Start
Debug
Any CPU
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'Lab1_Complete_VS2012' (1 project)
Lab1_Complete_2015
My Project
Class1.vb
Lab1_Complete_2015
Class1.vb
Application
Compile
Debug
References
Resources
Services
Settings
Signing
My Extensions
Code Analysis

Configuration: N/A Platform: N/A

References:

Reference Name	Type	Version	Copy Local	Path
AcCoreMgd	.NET	20.0.0.0	False	C:\ObjectARX 2015\inc\AcCoreMgd.dll
AcDbMgd	.NET	20.0.0.0	False	C:\ObjectARX 2015\inc\AcDbMgd.dll
AcMgd	.NET	20.0.0.0	False	C:\ObjectARX 2015\inc\AcMgd.dll
System	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic
System.Core	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic
System.Data	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic
System.Data.DataSetExtensions	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic
System.Xml	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic
System.Xml.Linq	.NET	4.0.0.0	False	C:\Program Files (x86)\Reference Assemblies\Mic

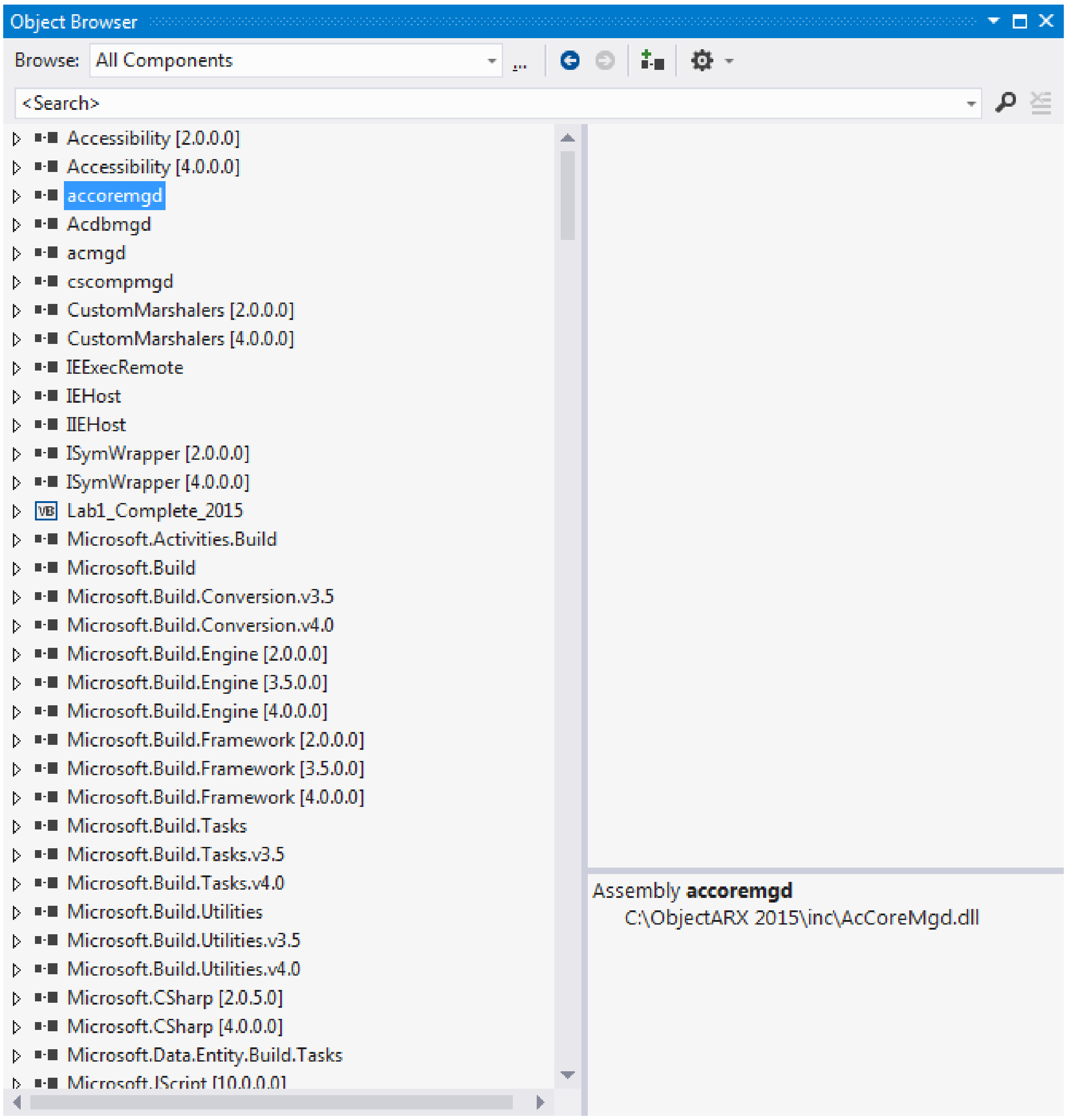
Properties

AcDbMgd Reference Properties

(Name)	AcDbMgd
Copy Local	False
Culture	True
Description	False
Embed Interop Types	False
File Type	Assembly
Identity	Acdbmgd
Path	C:\ObjectARX 2015\inc\AcDbMgd.dll
Resolved	True
Runtime Version	v4.0.30319
Specific Version	False
Strong Name	False

Note: acdbmgd.dll contains ObjectDBX managed types (everything to do with manipulating drawing files). acmgd.dll contains the AutoCAD's managed types classes which only work in AutoCAD.

- Use the Object Browser to explore the classes available in these managed modules. (View > Object Browser). Expand the "AutoCAD .NET Managed Wrapper" object. (acmgd) Throughout the labs we will be using these classes. In this lab an instance of "Autodesk.AutoCAD.EditorInput.Editor" will be used to display text on the AutoCAD command line. Expand the "ObjectDBX .NET Managed Wrapper" object. (acdbmgd) The classes in this object will be used to access and edit entities in the AutoCAD drawing. (following labs)



Accessibility [2.0.0.0]
Accessibility [4.0.0.0]
accoremgd
Acdbmgd
acmgd
cscompmgd
CustomMarshalers [2.0.0.0]
CustomMarshalers [4.0.0.0]
IEExecRemote
IEHost
IIEHost
ISymWrapper [2.0.0.0]
ISymWrapper [4.0.0.0]
Lab1_Complete_2015
Microsoft.Activities.Build
Microsoft.Build
Microsoft.Build.Conversion.v3.5
Microsoft.Build.Conversion.v4.0
Microsoft.Build.Engine [2.0.0.0]
Microsoft.Build.Engine [3.5.0.0]
Microsoft.Build.Engine [4.0.0.0]
Microsoft.Build.Framework [2.0.0.0]
Microsoft.Build.Framework [3.5.0.0]
Microsoft.Build.Framework [4.0.0.0]
Microsoft.Build.Tasks
Microsoft.Build.Tasks.v3.5
Microsoft.Build.Tasks.v4.0
Microsoft.Build.Utilities
Microsoft.Build.Utilities.v3.5
Microsoft.Build.Utilities.v4.0
Microsoft.CSharp [2.0.5.0]
Microsoft.CSharp [4.0.0.0]
Microsoft.Data.Entity.Build.Tasks
Microsoft.JScript [10.0.0.0]

Assembly **accoremgd**
C:\ObjectARX 2015\inc\AcCoreMgd.dll

- Now that we have the classes referenced we can import them. At the top of Class1.vb above the declaration of Class1 import the ApplicationServices, EditorInput and Runtime namespaces.

```
Imports Autodesk.AutoCAD.ApplicationServices
Imports Autodesk.AutoCAD.EditorInput
Imports Autodesk.AutoCAD.Runtime
```

Define your first command

- We will now add our command to Class1. To add a command that can be called in AutoCAD use the “CommandMethod” attribute. This attribute is provided by the Runtime namespace. Add the following attribute and Sub to Class1. Notice the use of the line continuation character “_”.

```
Public Class Class1

        <CommandMethod("HelloWorld")> _
        Public Sub HelloWorld()
        End Sub

End Class
```

- When the “HelloWorld” command is run in AutoCAD, the HelloWorld Sub will be called. In this Sub we will get the instance of the editor class which has methods for accessing the AutoCAD command line. (as well as selecting objects and other important features) . The editor for the active document in AutoCAD can be returned using the Application class. After the editor is created, use the WriteMessage method to display “Hello World” on the command line. Add the following to the Sub HelloWorld:

```
Dim ed As Editor = Application.DocumentManager.MdiActiveDocument.Editor
ed.WriteMessage("Hello World")
```

Test in AutoCAD

- To test this in AutoCAD we can have Visual Studio start a session of AutoCAD in debug mode. Simply

  a.Right click on “Lab1” in Solution Explorer and select “Properties”.
  b.In the Lab1 Property Pages dialog select “Configuration Properties > Debugging.
  c.In the Start Action area, select “Start external program:”.
  d**.** Next use the ellipses button and browse to acad.exe.
  e.Select acad.exe and press “OK”.
  f.After changing this setting hit F5 or select Debug>Start from the menu to launch a session of AutoCAD. This will build your application and start AutoCAD automatically or stop after building if there are any errors. Try fixing any build errors you may have.

- The “NETLOAD” command is used to load the managed application you just built. Type NETLOAD on the AutoCAD command line to open the “Choose .NET Assembly” dialog. Browse to the location of “lab1.dll” (..\lab1\bin\debug) select it and then hit open.

- Enter “HelloWorld” on the command line. If all went well, the text “Hello World” should appear. Switch to Visual Studio and add a break point at the line: ed.WriteMessage(“Hello World”). Run the HelloWorld command in AutoCAD again and notice that you can step through code. The “Debug” menu in Visual Studio has several options to step through the flow of execution in your program.

A point to note for future reference is that if you do get problems loading your application, use the fuslogvw.exe to diagnose.

Back in Visual Studio try Exploring the CommandMethod attribute in the ObjectBrowser. Notice that it has seven different flavors. We used the simplest one that only takes one parameter, the name of the command. You can use the other parameters to control how the command will work. For example, you can specify command group name, global and local names, command flag (for the context in which the command will run), and more.

End of Lab1.