LAB 7 REQUIREMENTS

Problem:

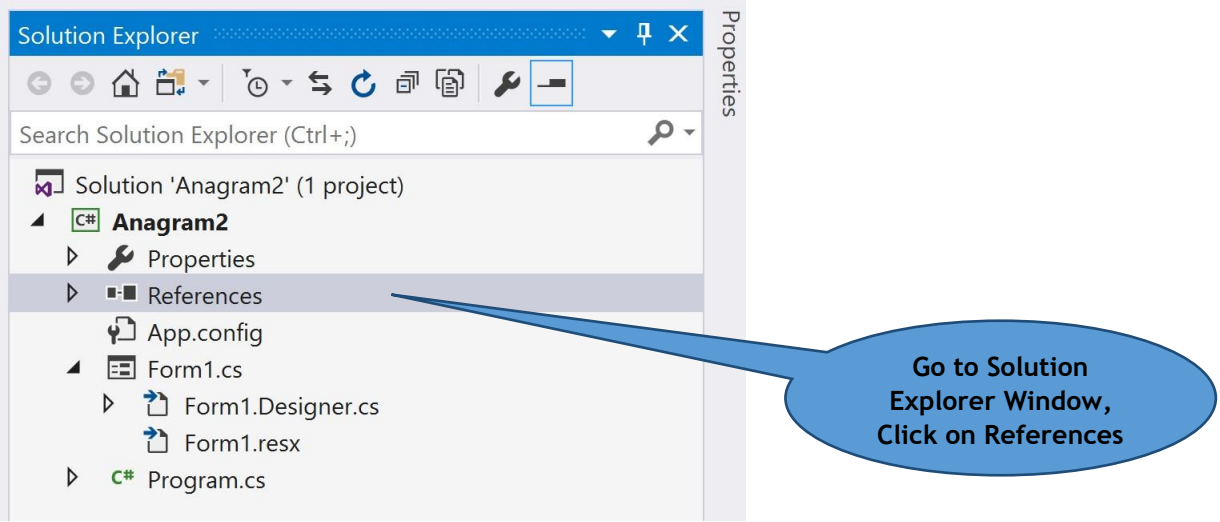
Anagram n: a word or phrase spelled by rearranging the letters of another word or phrase

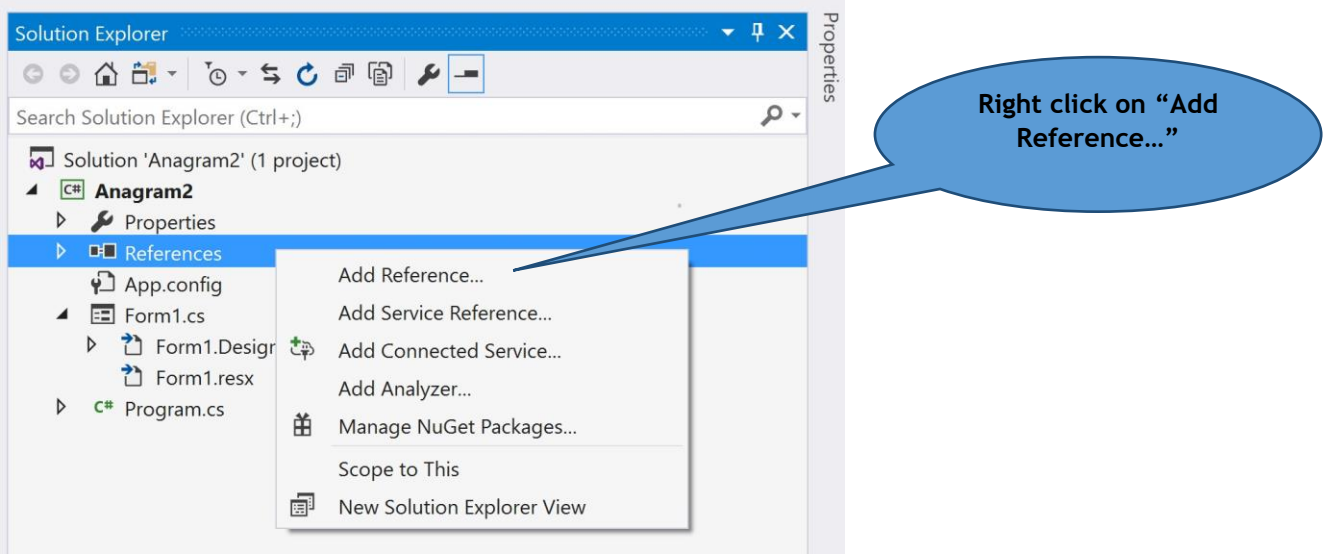
An example of an Anagram of the word *Dormitory* is *Dirty Room* since you can rearrange the letters in *Dormitory* to spell *Dirty Room*. In this lab, you will read in several words from a file (dict.txt). These words will be our Word Dictionary. Next, you will read another file (pal.txt) where each line of the file will be a sentence. This will be our Potential Anagram List (PAL). Everything will use capital letters. For every line that you read from the Anagram List (pal.txt), you will compute its histogram (ignoring spaces) and compare it with the histogram computed for each word in the Word Dictionary. If you find that the phrase from the Potential Anagram List has a histogram that is the same as the histogram for one of the words in the Word Dictionary, you will add the pair to a ListBox to show the user that you have found an Anagram/Word pair.

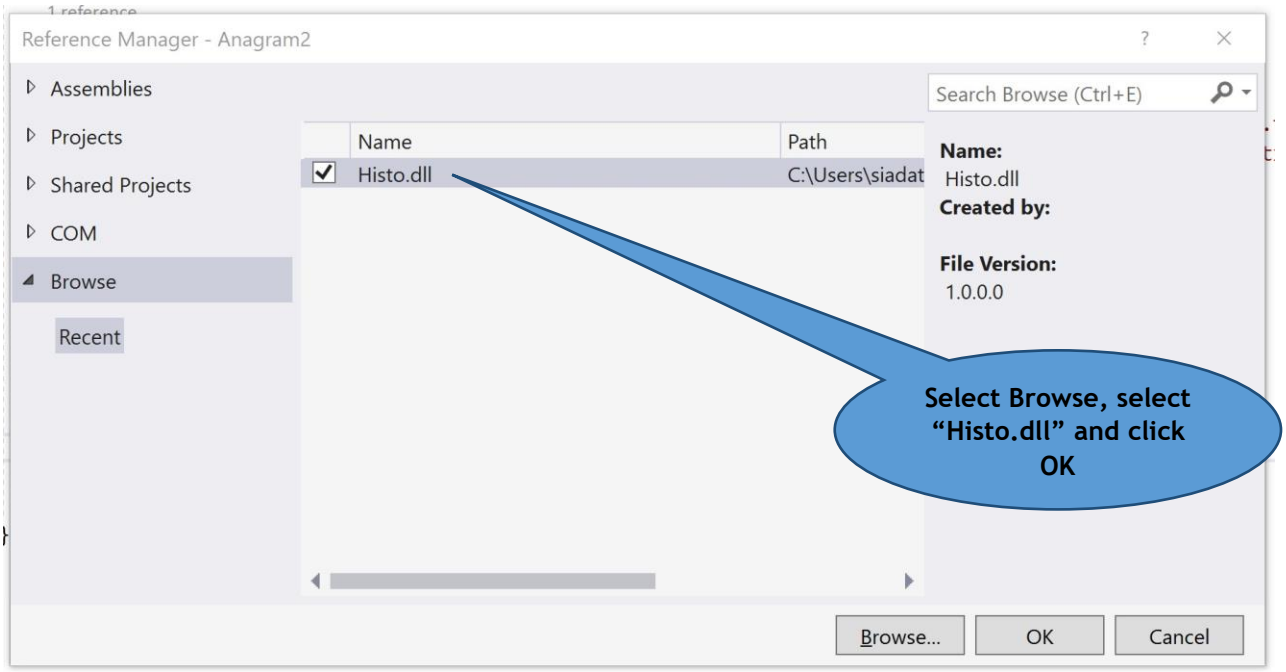
In addition, you will practice a library that was created in another language, Visual Basic (VB). As the application programmer there is no requirement on your side to know anything about VB but you will need to know how to include a library (.dll) that has been created using VB in your project. This lab contains step-by-step instructions on how to add such library to your project and use the methods defined in the library. In your application you will be calling a method that computes the histogram for the given word or phrase.

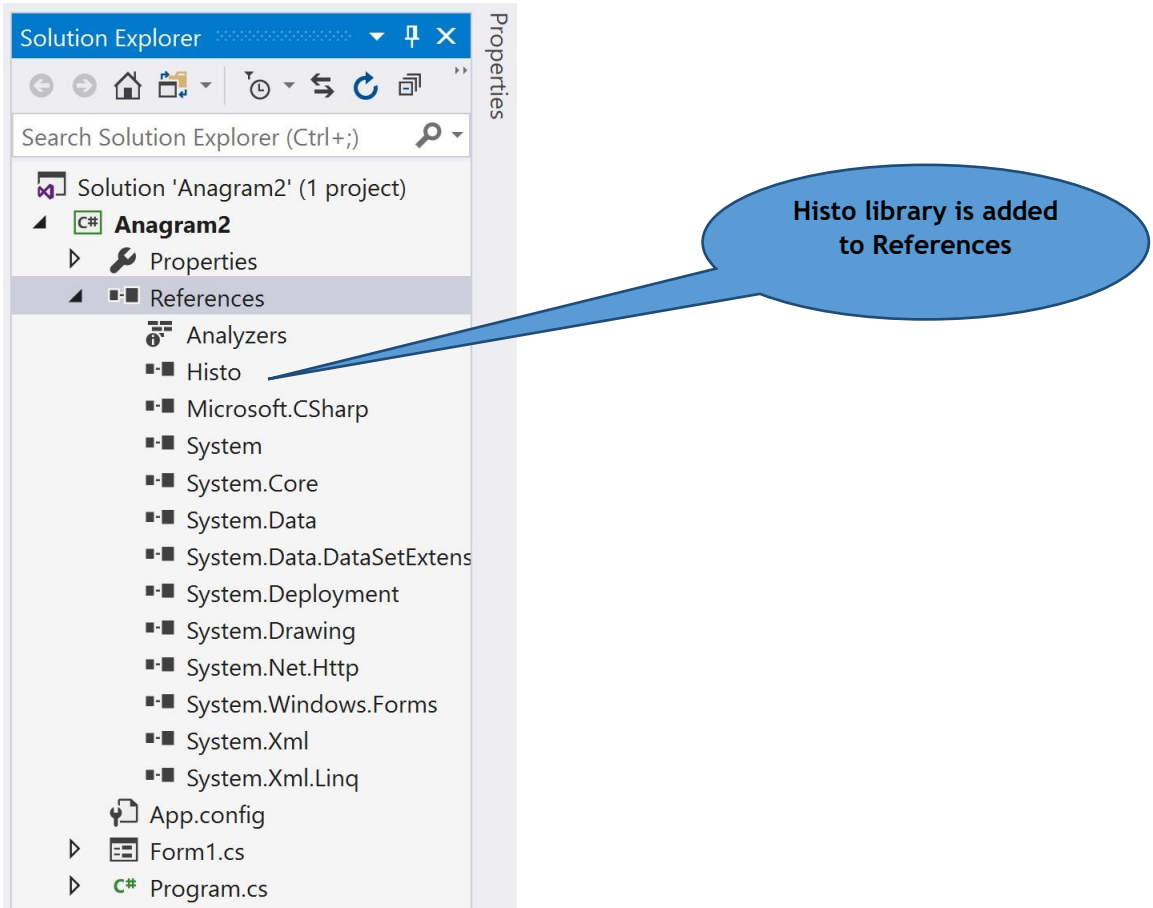
PART A

The Histo library (Histo.dll) is provided for you with a method (CreateHistogram) that counts and creates the histogram of the characters in a given word or phrase. You will simply include this library on to your project and then you will be able to call this method. Follow the steps shown in the following screenshots to include Histo.dll to your solution References folder.


Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'Anagram2' (1 project)
Anagram2
Properties
References
App.config
Form1.cs
Form1.Designer.cs
Form1.resx
Program.cs
Properties
Go to Solution Explorer Window, Click on References


Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'Anagram2' (1 project)
Anagram2
Properties
References
App.config
Form1.cs
Form1.Designr
Form1.resx
Program.cs
Add Reference...
Add Service Reference...
Add Connected Service...
Add Analyzer...
Manage NuGet Packages...
Scope to This
New Solution Explorer View
Properties
Right click on "Add Reference..."


Reference Manager - Anagram2
Assemblies
Projects
Shared Projects
COM
Browse
Recent
Search Browse (Ctrl+E)
Name
Path
Histo.dll
C:\Users\siadat
Name:
Histo.dll
Created by:
File Version:
1.0.0.0
Select Browse, select "Histo.dll" and click OK
Browse...
OK
Cancel


Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'Anagram2' (1 project)
Anagram2
Properties
References
Analyzers
Histo
Microsoft.CSharp
System
System.Core
System.Data
System.Data.DataSetExtens
System.Deployment
System.Drawing
System.Net.Http
System.Windows.Forms
System.Xml
System.Xml.Linq
App.config
Form1.cs
Program.cs
Properties
Histo library is added to References

Now you are ready to use the Histo library. As mentioned, the Histo library contains the CreateHistogram subroutine in VB. A subroutine in VB is similar to a method in C# with no returning variable/value. Below is a screenshot of the Histo library program in VB. You do not need to know how the program is written and its VB syntax but you need to know what the program does and how to use it. It has a method that creates the histogram of a given word or phrase. You can invoke this subroutine from within your C# program as if it is a defined method in your C# environment.

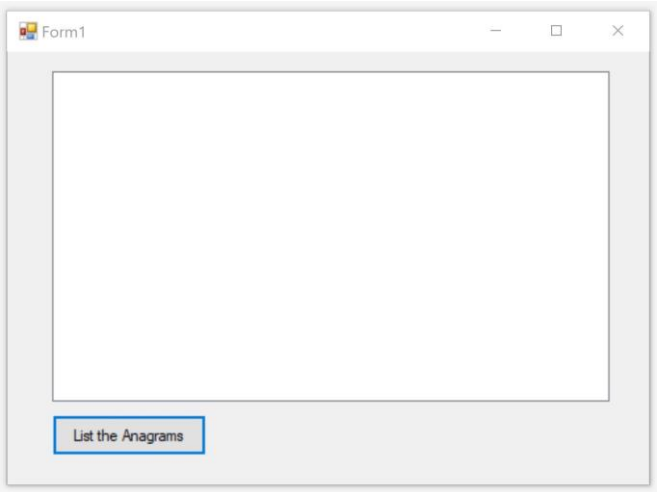
Class1.vb

Histo | Histogram

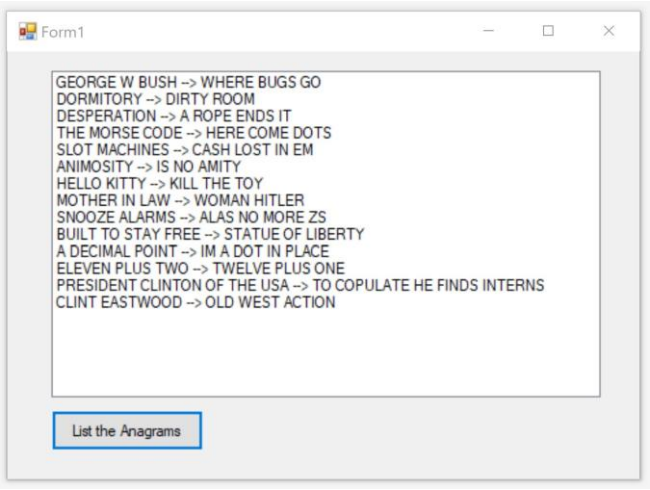
```
'<summary>
'This Class contains a Method, Histo(), that requires
'an empty array Of suze 26 (indexed 0 To 25) And a String.
'This method will leave the number Of times a letter occurs
'in the string in the array index corresponding with the letter
'using the following scheme:
'0 --> A
'1 --> B
'2 --> C
'...
'27 --> Z
'Case does not matter and spaces are ignored. The array is passed
'by reference and there is no return value.
'</summary>
0 references
Public Class Histogram
    0 references
    Public Shared Sub CreateHistogram(theArry() As Integer, theWords As String)
        ' 2 param: array ByRef and string
        Dim x, ind As Integer
        Dim tempChar As Char
        For x = 0 To theArry.Count - 1
            theArry(x) = 0
        Next
        For x = 0 To theWords.Count - 1
            tempChar = theWords.Substring(x, 1).ToUpper()
            ind = AscW(tempChar) - 65
            If ind >= 0 And ind <= 25 Then
                theArry(ind) += 1
            End If
        Next
    End Sub
End Class
```

PART B:

Design a simple form similar to image below using Visual Studio in C# as your default language. It contains a button and a listbox.



Your program result may look like the screenshot below when the user clicks on the button.



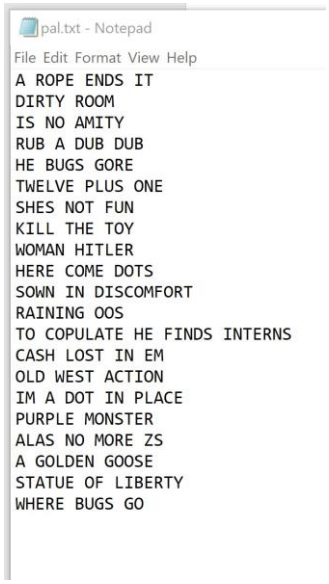
Here is an example of how to call CreateHistogram subroutine from Histogram class within Histo library:

```
Histo.Histogram.CreateHistogram(theHistogram1, palWord);
```

where *theHistogram1* is an empty histogram (array of integers) passed to CreateHistogram "by reference." Note that when an array is passed to a method, it is passed "by ref" by default. The palWord is a string variable that contains a line from the dict.txt

```
dictWord = input1.ReadLine();
```

Two input files are provided for you with this lab assignment: dict.txt and pal.txt



DO NOT CHANGE OR MODIFY THESE FILES!

STEPS FOR SUBMITTING YOUR LAB:

For each lab and following comments must be added at the beginning of your Visual Basic code.

/*

LAB #

SEMESTER NAME

STUDENT'S FIRST NAME, LAST NAME

I fully understand the following statement.

OU PLAGIARISM POLICY

All members of the academic community at Oakland are expected to practice and uphold 'standards of academic integrity and honesty. An instructor is expected to inform and instruct 'students about the procedures and standards of research and documentation required of students 'in fulfilling course work. A student is expected to follow such instructions and be sure the rules 'and procedures are understood in order to avoid inadvertent misrepresentation of his work. 'Students must assume that individual (unaided) work on exams and lab reports and documentation 'of sources is expected unless the instructor specifically says that is not necessary.

The following definitions are some examples of academic dishonesty:

- **Plagiarizing from work of others. Plagiarism is using someone else's work or ideas without giving the other person credit; by doing this, a student is, in effect, claiming credit for someone else's thinking. Whether the student has read or heard the information he uses, the student must document the source of information. When dealing with written sources, a**

clear distinction would be made between quotations (which reproduce information from the source word-for-word within quotation marks) and paraphrases (which digest the source information and produce it in the student's own words). Both direct quotations and paraphrases must be documented. Just because a student rephrases, condenses or selects from another person's work, the ideas are still the other person's, and failure to give credit constitutes misrepresentation of the student's actual work and plagiarism of another's ideas. Naturally, buying a paper and handing it in as one's own work is plagiarism.
Cheating on lab reports falsifying data or submitting data not based on student's own work.
***/**

All labs will be submitted electronically, no paper copies will be given to Lab mentors.

Before submission:

- Please create a folder named as Lab7_FName_LName:
- **Place your solution file under this folder.**
- **Zip the folder** then upload through Moodle. You will not be able to upload unless you zip, 7zip or rar the folder.

GETTING READY FOR AN INTERVIEW with your Lab Mentor:

The interview is 40% of your lab grade. Make sure to be prepared for your mentor's questions about your program.

When it is your turn to explain your lab to your Lab mentor follow these steps **while your lab mentor is present**:

1. Log on to Moodle.
2. Find your submission link for this lab.
3. Download your Lab on your computer
4. Find your lab wherever you downloaded it to.
5. Make sure to unzip (or extract) your folder
6. Open the solution file to demo your lab.

You must follow these steps each time you are being graded for your lab. Your lab mentor must confirm that you downloaded what was submitted on Moodle. You should be graded on what was uploaded on Moodle, not on a local copy obtained from your C drive or external drives (i.e. memory sticks).

HOW WILL YOU BE GRADED BY YOUR LAB MENTOR AND WHAT IS THE GRADING CRITERIA?

1. The application works and was fully tested from what was downloaded and demonstrated from the copy uploaded to Moodle and not from a local copy or any external drive. (50 points)
2. Proper naming conventions were followed as explained in class (10 points)
3. Grade assigned based on oral examination of the students understanding of their solution and the overall quality of the solution (40 points)

GRADE: _____ out of 100