Assembly Language
Assignment 4

- **Due:** Next section. **(**one night before if you submit by email**)**

The goals of this assignment are:
   A. To understand the components of a listing file.
   B. To understand the parts of the original source code.
   C. To understand how additional components are brought in by the build process.

When you have completed the assignment, you should have a better understanding of assembly language and be able to comprehend a simple program that someone else has written.

A. In "Visual Studio", create a new assembly project:
   1. File>New Project> Visual C++>win32>win32 Console Application
   2. Use the following name "asm_asg3.b_groupName", and uncheck "Create directory for solution"
   3. Form the wizard choose "empty project", uncheck other options, and finish.
   4. In the Solution Explorer, Delete the folders (Header files, Resource files, and Source files)
   5. Right-click the project in the Solution Explorer window>Build Customizations""> check MASM.

B. Download '' reverse.rar '', extract to specific place (e.g. c:\), then add the "reverse.asm" to the "asm_asg3.b_groupName" as following:
   - Right-click the project in the solution Explorer>add>exiting item> navigate to "reverse.asm"

C. At this moment, you still can't build the project because "reverse.asm" contains "Include Irvine32.inc" instruction ^(Try it by yourself and check error 1). To handle this, Right-click the projects in the Solution Explorer select "properties" and modify the following properties:
   1. Configuration Properties> Microsoft Macro Assembler>General>Include Paths, set value with the Irvine source folder path (e.g. c:\Irvine).
   2. Configuration Properties>Linker>General>Additional Library Directories, set value with the Irvine source folder.
   3. Configuration Properties>Linker>Input>Additional Dependencies, add "Irvine32.lib" to the current value.
   4. To enable the creation of the ".lst" file do the following: Configuration Properties> Microsoft Macro Assembler>Listing File>Assembled Code Listing file, set the value with "$(ProjectName).lst".

D. Now, build and execute the project. Then find the "asm_asg3.b_groupName.lst". Open the file with a text editor (e.g. notepad, or recommended notepad++) and answer the following:
   1. You accurately, and in detail, describe what reverse.asm does and how it works. You must identify and create lists of:
      i. All the Intel instructions that are used.
      ii. All the MASM assembly directives that are used.
      iii. All the labels (named memory locations) that are used.
   2. Identify the components of the listing file and what they mean.
   3. For all the procedures, parameters, locals, and symbols; Indicate their source (i.e., where they come from). How did all these things wind up in the listing file?

You are asked to submit a report to answer the previous questions attached with a copy of the project folder.