MSU CSC 325 –Using MS Visual Studio 2013 C++
Mar. 23, 2016

The goals of this exercise: Use MS Visual Studio for the fundamental operations of C++

- Create a project with C++ files
- Add C++ files to a project
- Compile (build) the project
- Run to completion
- Set a breakpoint
- Use the operations: run (to breakpoint), Step into, and Step Over

You will do two examples of creating projects and executing code.

Example 1: The code is contained in one C++ file, **unsigned.cpp.**

- Note that the provided code contains an infinite loop. Use the debugger to observe the operation of that loop and the behavior of the variable u that causes the infinite loop.

Example 2: The code is contained in three C++ files,
mainmath.cpp, LocalMath.h, LocalMath.cpp

- Change mainmath.cpp to use the recursive function factorial() rather than the looping function fact(). Use the debugger to step into each level of recursive call.

Notes:

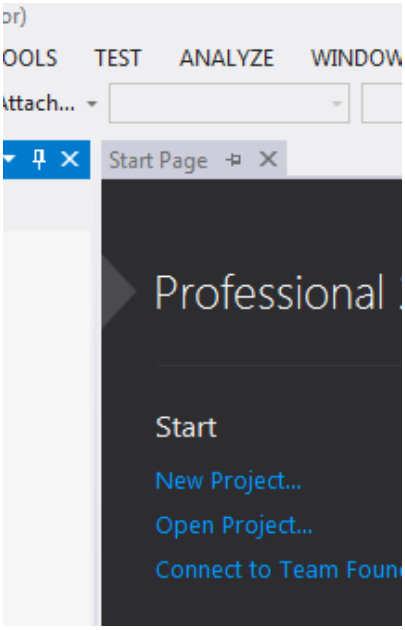
- Creating an MS Visual Studio project will work best if you start from an empty project.

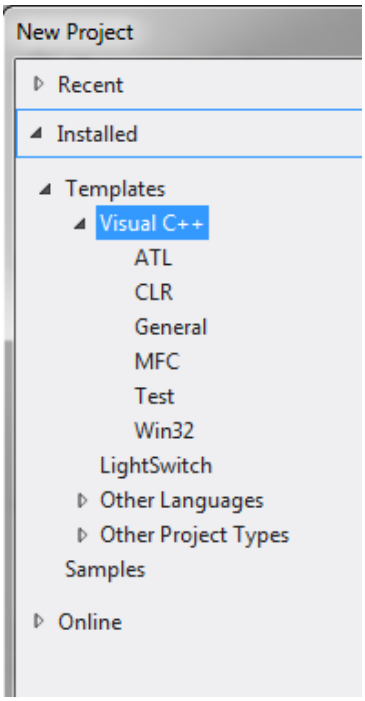
Important for this exercise: Visual Studio is complicated and confusing. Read the directions and be patient. If necessary, start over.

Part I. Creating a new project for C++ programs

1. Start up *Microsoft Visual Studio 2013* by clicking the Windows 8 logo, If this is your first time using *Visual Studio* on a particular machine, the *Choose Default Environment Settings* window will appear. Select the ***Visual C++ Development Settings*** option and click the ***Start Visual Studio*** button (*Be patient, it takes approx. 45 seconds to finish the setup).*

2. In the *Start Page* pane, click the ***New Project*** option *(see below left).* The *New Project* window will appear *(see below right).*





3. In the *New Project* window:

   a) Under *Installed Templates* (the left pane), click the '▷' sign left to ***Visual C++*** if its list is not opened, then select ***Win32*** in the list. DON'T CLICK OK YET!

   b) In the middle pane, select ***Win32 Console Application***. DON'T CLICK OK YET!

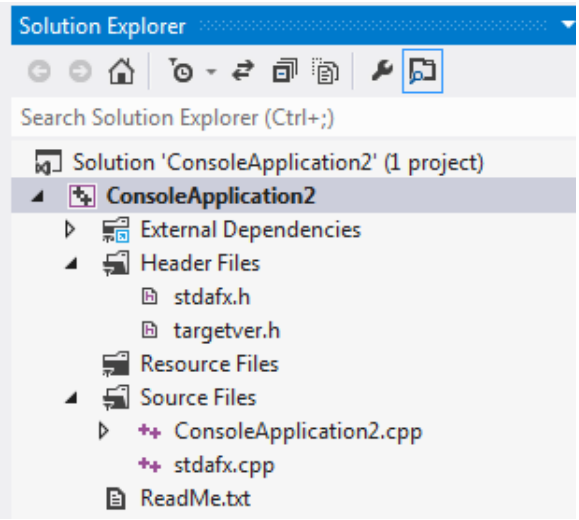
   c) In the *Name* text box (near the bottom of the window), enter the name of the project: ***labProject5*** or any name you prefer – remember this name because you will use it later. DON'T CLICK OK YET!

   d) In the *Location* text box, type ***C:\TEMP*** or any folder you prefer.
   Note: Files on lab computers will always be deleted as you log out. It's your responsibility to copy data to permanent storage. Do not expect that files in the default location, even though that location contains your MSU login, will be reliably saved upon your logout.

   e) Click the ***OK*** button. The *Win32 Application Wizard* window will appear.

4. In the *Wizard* window, select the ***Finish*** button. That creates a dummy "main" program that you don't need.

5. At left, four “subfolders” of the project will appear in the Solution Explorer window: External Dependencies, Header Files, Resource Files, and Source Files. If no subfolders are shown, you may click the ‘▷’ sign at the front of the project icon.

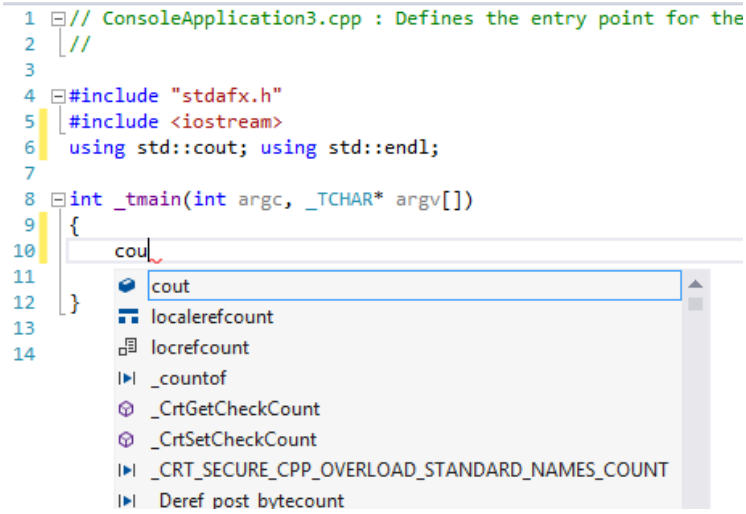


- ☐ Right-click on all files under “Header Files” and Remove them. *Probably don’t Delete.* ☺
- ☐ Right-click on all files under “Source Files” and Remove them. *Doesn’t matter if Delete.*
- ☐ Right-click on “Source Files” and **Add -> Existing Item** the appropriate C++ files provided for this exercise:

  For Example 1, add **unsigned.cpp.** Finish the remaining steps of this exercise.

  For Example 2, remove **unsigned.cpp,** then add **mainmath.cpp, LocalMath.h, LocalMath.cpp**
- ☐ Double-click on a C++ file to bring up the Visual Studio editor pane.

6. Type into the editor window using standard C++ operation, such as the word **cout**. A popup window will show the syntax and usage of the C++ operation as you type *(see example below)*

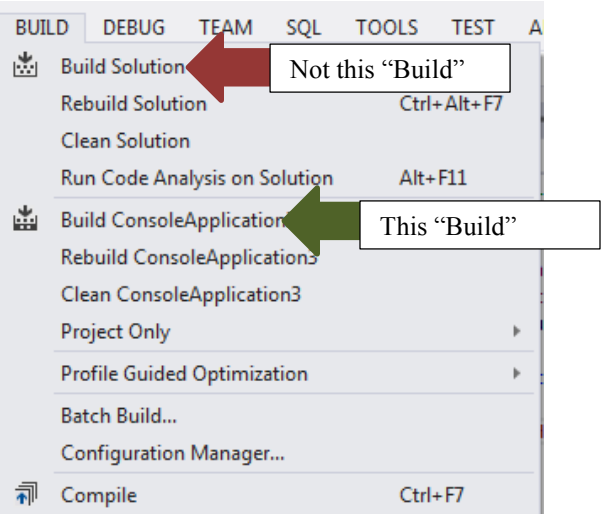


7. Set a “breakpoint” by clicking in the gray column to the left of the code, which creates a red circle. A yellow arrow indicates the current line to be executed. (I believe you must have a

breakpoint set to debug – it doesn't appear to single-step from the beginning without a breakpoint.) *Can you explain a "breakpoint"?*

8. Select the menu choice **Build → Build ThatNameYouUsed** to build (compile) the program. Status (success or failure) will be reported in the lowest window of the Visual Studio.

A common compile error is **"unexpected end of file while looking for precompiled header. Did you forget to add '#include "stdafx.h"' to your source?"** Fix that error by selecting the menu option Project -> ThatNameYouUsed Properties (last item in menu) -> Configuration Properties -> C/C++ -> Precompiled Headers. Change the value of **Precompiled Header** from **Use (/Yu)** to **Not Using Precompiled Headers.** Then select the menu choice **Build → Build ThatNameYouUsed.**



9. Select the menu item Debug → Start Debugging to run the program.

While debugging, experiment with the use of the controls at the top,  for Step Into, Step Over, and Step Out. Find out what actions those controls perform.

10. Observe the values of variables in the the display at the bottom of the screen. Make the values change by selecting breakpoints and using the step controls.

11. Exit *Visual Studio*:

a) Make sure to save all your work before exit by selecting menu ***File*** -> ***Save All***.

b) Select the menu ***File*** -> ***Exit***.

c) Now you will see that a single C++ *project folder* named **ThatNameYouUsed** has been created in the folder you selected. Note that, in this *project folder*, several files and subfolders have been created *automatically*. **You should NOT manually alter any content of this folder.**