HOWTO: Setup a Windows development environment for OpenGL and GLUT

Procedure I followed on my Windows 8 (64bit) machine at home (should be the same for Windows 7)
(Make sure you stick with 32/64bit downloads depending on your system version)

Visual Studio is free
http://www.microsoft.com/visualstudio/eng/downloads
Download Link for Visual Studio Express 2012 for Windows Desktop
http://go.microsoft.com/?linkid=9816758
Downloaded the Installer and Ran it
Agreed to the terms
Clicked INSTALL
Waiting...
Eventually LAUNCH appears, click
Register (why not? otherwise it only works for 30days)

OK, now we need freeglut and glew libraries

Freeglut is here - if you are brave and want to build it yourself
http://freeglut.sourceforge.net/
Windows packages are here (I downloaded the MSVC version, it has both 32 and 64 bit)
http://www.transmissionzero.co.uk/software/freeglut-devel/

Glew is here (and so are Windows binaries - I downloaded both 32 and 64 bit)
http://glew.sourceforge.net/

Installing FreeGLUT
Extract the zip package that was downloaded
Read the README (folllow Installation instructions)
Make the C:\Program Files\Common Files\MSVC\freeglut directory
Copy the 'include' and 'lib' directories to this new folder (Ctrl-Click and Drag to copy)

OK - Now, the first confusing part WARNING!!
Copy the DLL library files to the following locations
In the freeglut/bin directory copy the (32bit) freeglut.dll to
  on 64-bit system: C:\Windows\SysWOW64 and the (64bit in x64 folder) to
C:\Windows\System32

On a 32 bit system copy (32bit) freeglut.dll to C:\Windows\System32

Oh Microsoft!!!

Let's set up a project and see if it works - let's do a 32-bit project which is fine for this class (following instructions from freeglut readme still)
Open Visual Studio 2012
CLick on 'New Project' at the left
Click on 'Empty Project' from the list MAKE SURE YOU PICK C/C++ PROJECT
Give it a name (FreeGLUT-Test) and click OK
Wait a few seconds....
Click on the Project menu and select Properties (dialog box pops up)
Click on 'Configuration Properties' in the left pane
Click on 'Configuration' Dropdown at the top left of the dialog box and select 'All Configurations'
Click on the 'C/C++' in the left pane
Click on the 'General' entry
Click on the 'Additional Include Directories' entry in the right pane (at the top)
Click on the drop down arrow at the right
Click on 'Edit'
Click on the little folder icon that is at the top of dialog that appears
Navigate to the directory you just created above until you see the 'include' directory
C:\Program Files\Common Files\MSVC\freeglut\include
Do NOT select the GL directory
Click OK and make sure the directory in the window is correct (no GL at the end)
Click OK if everything is good or go back and fix if not
Now Click on 'Linker' in the left pane
Click on 'Additional Library Directories' in the right pane (about halfway down)
Click on the drop down arrow at the right
Click on 'Edit'
Click on the little folder icon that is at the top of dialog that appears
Navigate to the lib directory where you copied freeglut (next to the include directory)
C:\Program Files\Common Files\MSVC\freeglut\lib
Click OK and make sure the directory in the window is correct
Click OK if everything is good or go back and fix if not
Now Click 'Advanced' under the 'Linker' entry in the left pane
Click on the 'Entry Point' line and enter (type) the following into the area to the right of the title
mainCRTStartup
Type that EXACTLY - see the readme for what it is
Click OK at the bottom right of the dialog

Now to test

Click the File Menu
Click New File
Click C++ on the left
Click C++ file

Click Open (why Open and not New? I do not know)
Copy the following into the window
----START LINE BELOW

```
#include <GL/freeglut.h>

int main(int argcp, char **argv) {

  /* Set window size and location */
  glutInit(&argcp, argv);
  glutInitWindowSize(640, 480);
  glutInitWindowPosition(0, 0);

  /* Select type of Display mode:
     single buffer & RGBA color */
  glutInitDisplayMode(GLUT_RGBA | GLUT_SINGLE);

  /*Initialize GLUT state */

  glutCreateWindow("Hello World");

  glutMainLoop();

  return 0;
```

----END LINE ABOVE
Save the file - make sure it shows up in the project pane over at the right side of the window
Click on Build Menu
CLick on Build Solution
The build should succeed in the Output window at the bottom
Click on Debug
Click on Start Debugging (or Start without Debugging)

You should see two windows pop open. The first (black) one is the console. The second is a White window with the title 'hello world' in it. The console window is useful for outputting trace statements using printf.

If this did not work - you did not follow the instructions -exactly-, try again.

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Now let’s setup GLEW

If you have a 64bit system (like I do) then download both versions of the library from the link above.
Extract both.

Let's make life easier...
Copy everything in the include directory into the freeglut\include\GL directory you created earlier
Now copy the file in the lib directory to the freeglut\lib

BE CAREFUL to copy the 64bit version into the x64 folder if you have a 64bit system and the 32bit version into the lib directory. If you have a 32bit system just copy everything into the lib directory (folder)

On a 64bit system (just as confusing as before - go slow, be careful)
Copy the files from the 32bit version of the library with the DLL extension in the bin folder to C:\Windows\SYSWOW64
Copy the files from the 64bit version of the library with the DLL extension in the bin folder to C:\Windows\System32

On a 32bit system
Copy the files from the 32bit version of the library with the DLL extension in the bin folder to C:\Windows\System32

You will notice two programs in the bin directory - glewinfo will generate a text file that will detail your OpenGL environment - please run this and keep the file. It will help us help you with problems later on.

Back to Visual Studio 2012
We will modify your existing little test program using freeglut to also take advantage if GLEW

Click on Project Menu
Click on Properties (you had this open before)
Click on Linker (to bring out the sub-list)
Click in 'Input'
Click on the drop down arrow across from 'Additional Dependencies'
Click on 'Edit'
Enter 'glew32.lib' into the box at the top
Click OK
Click OK (to make the properties dialog go away)

Add the following TWO lines to the TOP of your source file

```
#include <stdio.h>
#include <GL/glew.h>
```

These two lines should go before the #include <GL/freeglut.h> line

Then add the following AFTER the glutCreateWindow() function call

```
  GLenum err = glewInit();
  if (GLEW_OK != err)
  {
  }
  fprintf(stdout, "Status: Using GLEW %s\n", glewGetString(GLEW_VERSION));
```

Click on Build
Click on Rebuild Solution (it should rebuild without errors)

CLick on Debug Menu
Click on Start Debugging

The program should run again except two things are different

First the Window is black (don't worry)
Second the Console window has some output - it should say "Status: Using GLEW 1.9"

If you go this far you are go to start on Assignment #1

-Scott