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GEU111 – High-Tech Tools & Toys Lab
Creating a C++ Program in Microsoft Visual Studio 2005

Microsoft Visual Studio 2005 is a sophisticated environment designed for developing complex Windows applications. A complete "Project" consists of a "source program" (which you write) and all the linked header, library, and other resource files. We will be using very few of the features of this environment to run the relatively simple programs in this course, but we will need to link to external header files and libraries to use the National Instruments programs to control the PCI-6024E A/D card. Below is a step-by-step description of how to create a Project, add your C++ source program, and link to external header and library files.

1. Open MS Visual C/C++. On the computers in the "High-Tech Tools and Toys Lab" You will find this program under the Start button by following the links: **Programs>> Microsoft Visual Studio 2005 >> MS Visual Studio 2005**

2. Under the **File** menu choose **New >> Project** and then, in the **Visual C++ >> Win 32** Project Type, select **Win-32 Console Application.** Give the project a name (suggestion "`Lab7_xyz`" where "`xyz`" are your initials). Under "**Location**," use your memory stick if possible. Any files stored on the computer are likely to be erased or corrupted. Click **Next**, check the box for **Empty Application,** and press **Finish**.

3. You will now have created a folder called `Lab7_xyz` in your personal directory. This is your "Project Workspace." If you look in this folder you will find three files `Lab7_xyz.ncb, Lab7_xyz.sln, and Lab7_xyz.suo` and a folder `Lab7_xyz`. These files and folder contain information about your project.

4. To create a C++ program in your project you have to add a C++ *source file* to the Project. From the **Project** Menu, select **Add New Item >> Visual C++ >> C++ File**. Give your source file the same name as your project ("Lab7_xyz"). The **Project** and **Location** will be your `Lab7_xyz` Project and your Workspace on your memory stick. Click OK and you will be transferred to a text editor with an open file `Lab7_xyz.cpp`.

5. Write your C++ source code for your program. After the customary few lines of comments and before your `int main(void)` or `void main(void)` routine, insert the following:

```
#include <iostream>       // input/output to console
#include <nidaq.h>        //NI-DAQ routines for the PCI-6024E
```

Note: You will need to either add the NI-DAQ header directory to your path by using the **Tools >> Options >> Projects and Solutions >> VC++** menu (as described in 8 below) or use the entire path to `nidaq.h`:

```
#include <C:\Program Files\National Instruments\NI-DAQ\Include\nidaq.h>
```

6. To use the NI functions, you will also need to the library file `nidaq32.lib` to your Project. Under the **Project** menu, choose **Add Exiting Item** and mouse to the files in

C:\Program Files\National Instruments\NI-DAQ\lib. *You will need to specify the default file type as* **All Files** *or else you will see only the .h files*. Highlight the `nidaq32.lib` library (it may appear as just `nidaq32` if Windows suppresses file extensions) and press OK.

7. Under the **Build** menu, choose **Rebuild All** and hope for no compile or link errors. If OK, choose **Debug >> Start Without Debugging** and watch the program run. Debug, debug, debug.

8. If you set a path to C:\Program Files\National Instruments\NI-DAQ\Include, you will not need to put the entire path for `nidaq.h` into your `#include` statement. To do this, go to the **Tools >> Options >> Projects and Solutions >> VC++ Directories** menu, choose "**Include Files"** in the pull-down box, and then click in the "Directories" area until you get an open box. Click in the box until you get a gray button with three dots (**…**). Click on this and you will be able to click to the C:\Program Files\National Instruments\NI-DAQ\Include directory. This procedure allows the linker to find the header files in the National Instruments directory and Visual C will remember this setting henceforth.

9. Some other header files and library files that you might need for some NI-DAQ functions are:

```
nidaqcns.h
nidaqerr.h
nidaqex.h
Olderror.h
nidex32.lib
```

   There is also a *dynamic link library* `nidex32.dll` that may have to be in a directory that is in the path MS Visual C++ searches for execution-time libraries. Don't worry about any of these files unless you are using a NI-DAQ program that indicates you need them.

10. When you finish your work for the day, copy your Workspace folder to your memory stick if it is not already there. Make sure you have a copy of your source file at least. To restart your program when you come back to the lab, reconnect your memory stick with your files and Workspace folder. You can then restart MS Visual C++ and, from the **File** menu, open the Workspace or the Project and you should be ready to go.