Windows Simulator and Library

Installation | Your First Project

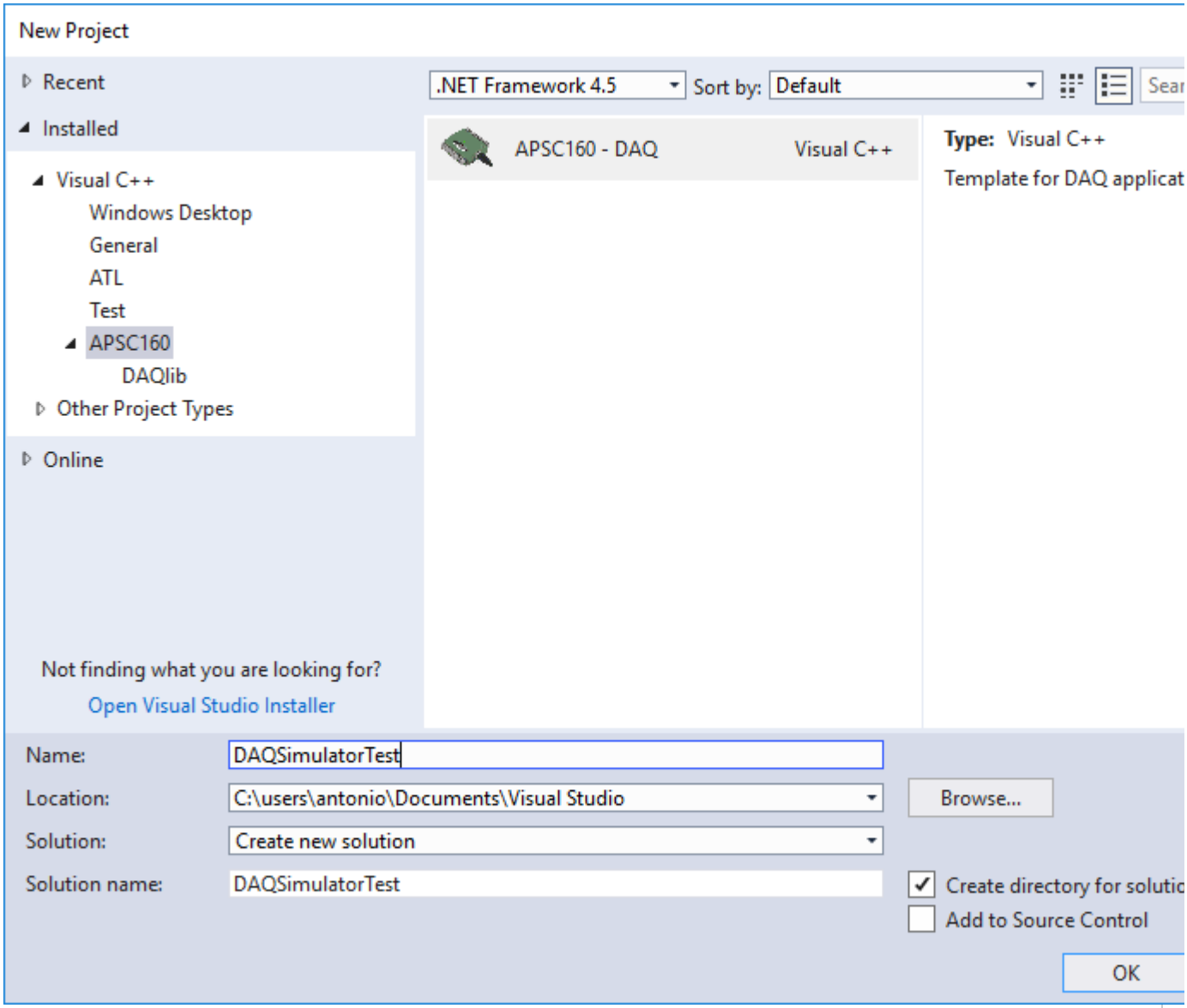
A Simple DAQ Program

To get started, we will create a simple program that uses the DAQ simulator.

Start the Visual Studio IDE by double clicking its icon on the desktop. You may see a dialog that prompts you to *Start with a familiar environment*, in which case select *Visual C++* for the **Development Settings** and then click the **Start Visual Studio** button.

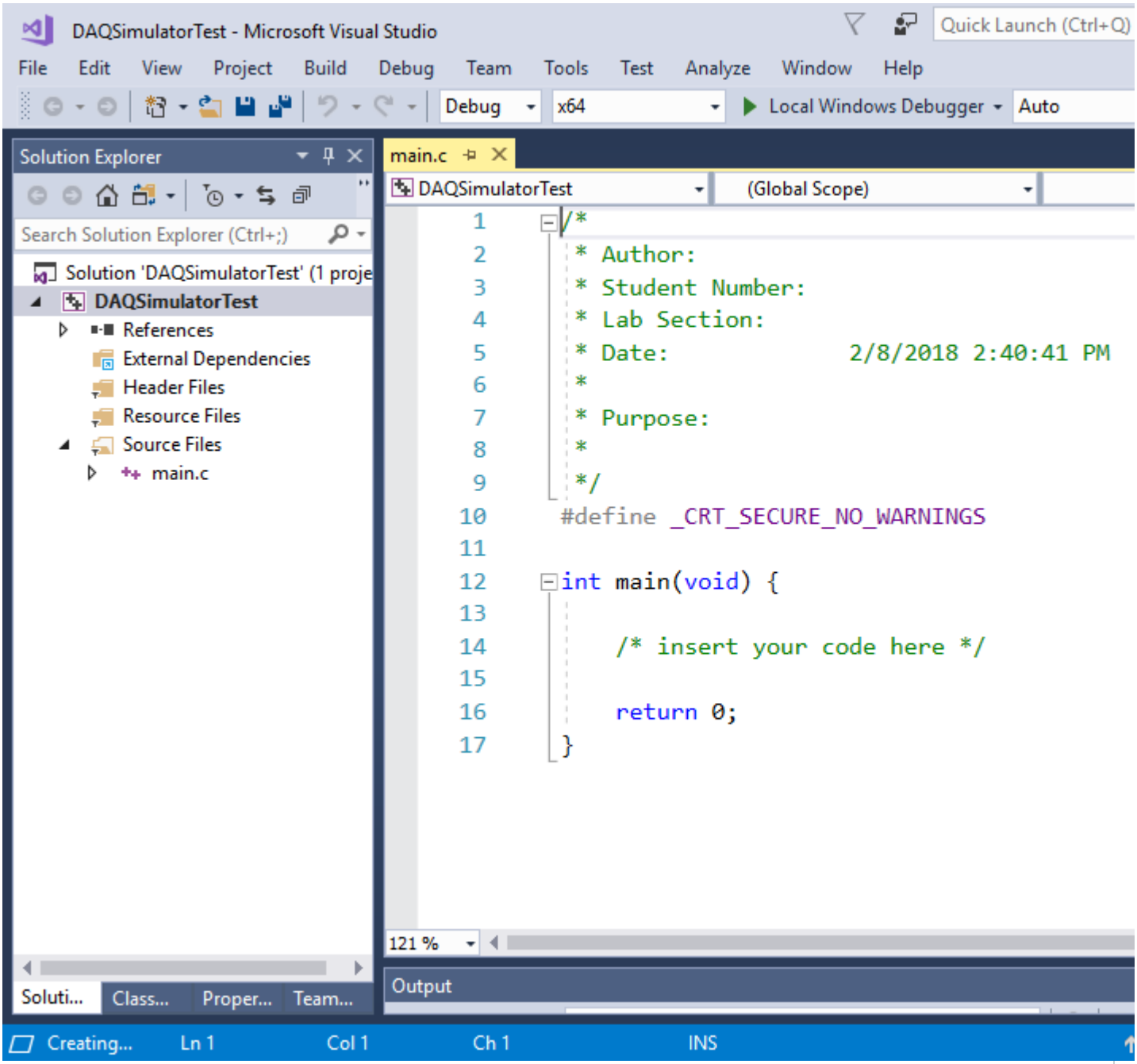
We will begin by creating a project as follows:

- Select the **File** menu, then **New**, then **Project**.
- When the **New Project** dialog box opens, select **Installed**, **Templates**, **Visual C++** and then **APSC160** in the left panel, and then select **APSC160 - DAQ** in the right panel.
- Enter a descriptive name for your project, e.g. **DAQSimulatorTest**
- Select an appropriate location to save your project using the **Browse** button.
- The **New Project** dialog should now look like this:



- Click **OK**.

A new project will be displayed, which should look something like the following:



A new source file called main.c will automatically be generated for you under **Source Files**. You can change the name of this file to something more descriptive by doing the following:

- Right-click on the main.c
- Select **Rename** from the drop-down menu
- Enter a descriptive name for the new source file (e.g. DAQSimulatorTest.c).

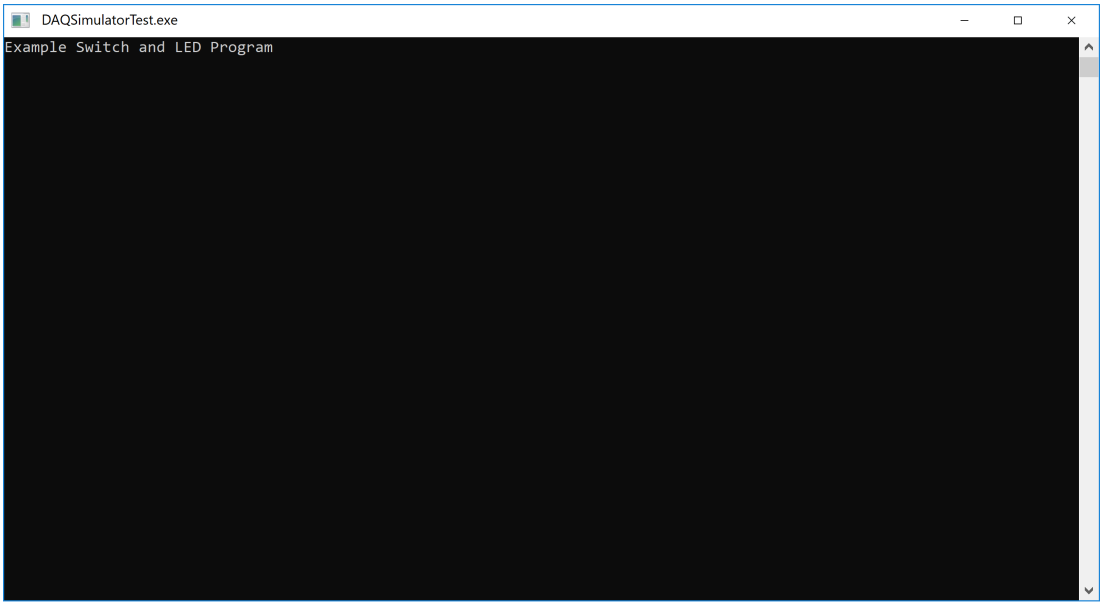
Now add code to the source file so that it looks like the following. Include your own name, student number, *et cetera* at the top of the code.

DAQSimulatorTest.c (https://apsc160.github.io/daqinstall/src/DAQSimulatorTest.c)

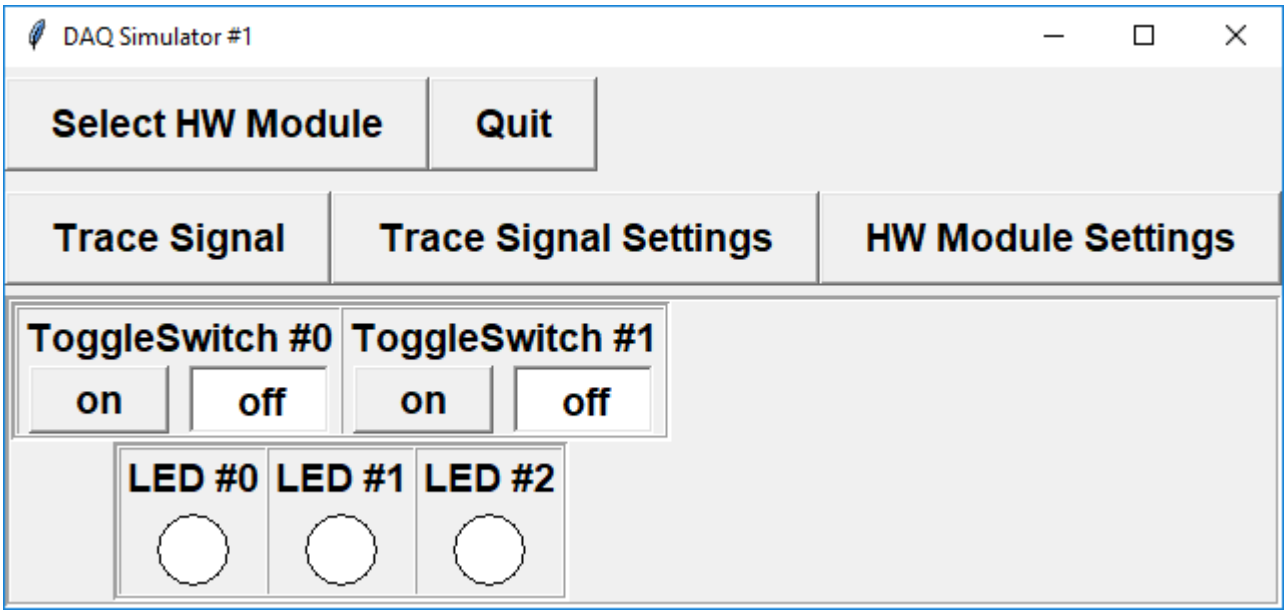
We do not expect you to understand the code that you are typing yet (that will come in the next few weeks).

To compile and link the source files in your project, choose **Build Solution** from the **Build** menu or press **F7**. This will compile all of the source files in your project (in this case there is only one) and then link them with the DAQlib library to produce an executable file.

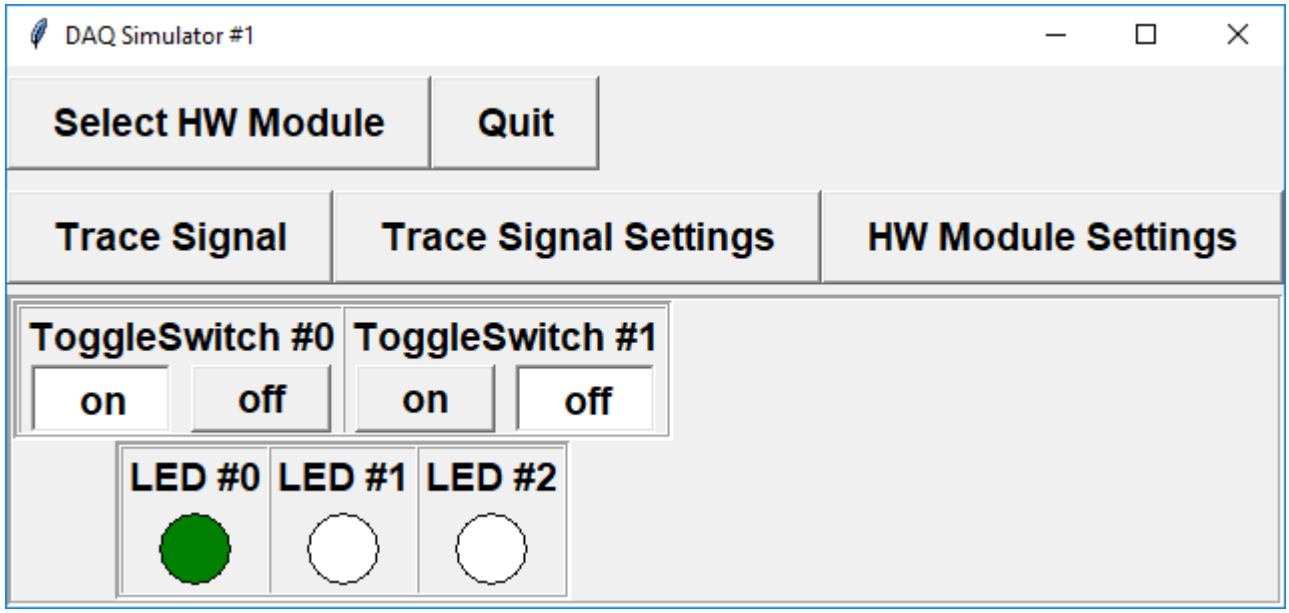
Run the program. If everything was installed successfully, a window like this one will appear:



A second or two later, the simulator window should appear:



Click the "**on**" button for the switch labelled **ToggleSwitch #0**. The left-most LED should turn green:



Congratulations! You have just completed your first DAQ program.

Important: do not simply open the above source file by double-clicking on it in your downloads folder. The source file *must* be added to your project in Visual Studio, and the project *must* have been created using the APSC160 - DAQ template. Otherwise, the file will not be compiled, and the project will not be able to find the required DAQlib library.

Running DAQ Programs Outside Visual Studio

When you compile your programs with the DAQlib library, they now depend on certain files contained in the DAQlib installation folder:

- **DAQlib.dll** - dynamic library file containing system-dependent routines
- **daqHardwareClient.exe** - main client program that communicates with the DAQ hardware
- **daqSimulator.exe** - the DAQ simulator program
- ... and several other DLLs and configuration files found in the **bin32** or **bin64** subfolder

When running in Visual Studio, the project settings tell your computer where to find these files. However, if you try to run your program outside of Visual Studio (i.e. by finding the folder the compiled binaries are placed and double-clicking the executable), you will get an error about not finding the above dynamic library.

To resolve this, you need to tell Windows where to look for the required files. Windows searches for executables and libraries in directories contained in the system's **PATH** environment variable. You will need to add two paths to this variable:

- %APPDATA%\APSC160\DAQlib\bin64
- %APPDATA%\APSC160\DAQlib\bin32

The first applies when compiling Windows binaries for 64-bit targets, while the second applies when compiling for 32-bit targets. For instructions on adding to the system **PATH**, see **How to set the path and environment variables in Windows (https://www.computerhope.com/issues/ch000549.htm)**.