Lab 1 – 08227 Advanced Programming

This tutorial introduces the reader to some key C++ fundamentals.

Hello World

The following code displays 'Hello World' inside of a console window.

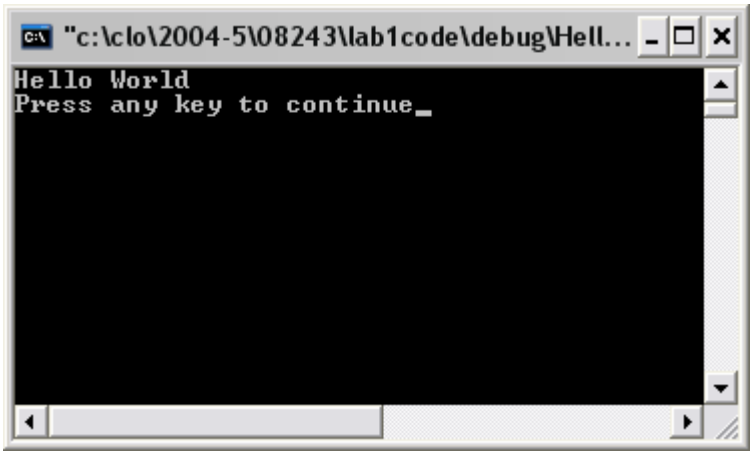
```
#include <iostream>
using namespace std;

int main (int argc, char **argv) {
   cout << "Hello World" << endl;
   return 0;
}
```

The first line of code tells the preprocessor that we would like to be able to read and write to the console window. The second line of code allows for easy use of the **std** functions.

The rest of the code is the **main()** procedure. Notice that the procedure takes two parameters, namely **argc** and **argv**. The parameter **argv** contains any parameters that where passed to the program when it was started, and the parameter **argc** holds the number of parameters passed to the program when it was started.

Inside of the **main()** procedure the code sends the phrase "Hello World" and an end of line character to the **cout** stream which appears in the console window.



Your Hello World

Download the **Lab1.zip** file and extract the files to **G:/08227/Lab1/**. Open the **Hello World** solution and then compile and run the program.

Run the program by double-clicking on it (inside the debug folder). A command window is automatically opened when you run a console application. This window is also automatically closed when the program terminates. Delay the termination of the program by adding the following line to the end of your code in the **main()** procedure:

```
system("PAUSE");
```

This now requests that a key be pressed before the termination of the program.

Using libraries

Comment out the statement:

```
#include <iostream>
```

Compile the program. What is the effect? Replace the statement and continue.

Now remove the statement

```
using namespace std;
```

Compile the program. What is the effect? Replace the statement and continue.

A new project

Create a new empty Win32 C++ Console project called **Temperature** by using the project application wizard. This is done by right clicking on the **Hello World** solution in the **Solution Explorer Window** (on the right of the IDE) and selecting **Add » New Project**.

***[NB:** Be careful to select a **C++ Win32 Console Application**, then select console and empty from the **Application Settings** tab]*

Create a new **cpp** file within the temperature project by right clicking on the **Temperature** project in the **Solution Explorer Window** and select **Add » Add New Item**. Write a program to input a Fahrenheit measurement, convert it and output a Celsius value. The conversion formula is

```
celsius = 5/9 * (fahrenheit-32)
```

*[**NB:** You may want to select the **Temperature** project as the default project; to do this right click on the **Temperature** project and select **Set as Startup Project**. Also what happens if you dividing two integers?]*

Clean up

Open the directory that contains your code. You will notice there are several files and a few folders that have been generated by Visual Studio. Most of these are generated during the build process and some of these files are quite large. Compare the total size of files/folders after the build process to that from the original downloaded lab files. The build process may change the size of the files from a few KB to several MB. This can get quite large as you increase the complexity of your software and you can soon occupy a large amount of storage space.

Therefore it is good practice to clean your Visual Studio solution when you are archiving your code (**and particularly when submitting your ACW!**) so that the build files are removed. Your source code and other files will remain intact so that you can build the software again at a later time.

In Visual Studio, select **Build » Clean Solution**. This will remove the build files and reduce the size of files somewhat. One more file that can be deleted is a database file that Visual Studio creates that can be quite large. This file will have the same name as the project and will have the file extension (**.sdf**) and is usually the largest file of all. You can safely delete this file once you have closed Visual Studio (but first backup your code etc. just in case something goes wrong).

Now clean up your two projects.