Exercise 2 – C Programming

Objective

The objective is simply to familiarise yourself with the programming environment.

Reference Material

This is based on the *C Programming* chapter.

This practical session is located in the following directory:

Windows Directory:	**c:\qacprg\cnotes**
Linux Directory:	**/home/user1/qacprg/cnotes**

Overview

The questions lead you through actions designed to give you an overview of steps required to use the Visual Studio programming environment. If you have any problems please raise them with another delegate or your instructor, this should be a very quick practical.

Practical Outline

1. Start Visual Studio. From the *File* menu select *Open Project/Project...*. (Ctrl+Shift+O) You should see the Open Project dialog box appear. From the dialog box select the **hello.sln** file from the `c:\qacprg\extras\cnotes` directory (You will have to browse to folder). This should open up the Solution Explorer displaying the **hello** project. The project is the first (and only) entry in tree structure within the Solution Explorer pane. The tree's root is labelled *Solution 'hello' (1 project)*. Solutions (not to be confused with the course **solution** sub-directories) are discussed later. Expand the **hello** project node to expose the **hello.c** source file. Double-click this entry and you should see the following program in the main window within Visual Studio.

```
#include <stdio.h>
int main(void)
{
    printf("Welcome to QA Training\n");
    return 0;
}
```

Select **hello.c** in the Solution Explorer pane and bring up the Context menu

(Right Mouse single-click) and select *Compile hello.c*. Verify that you get no errors and no warnings. You should see something like the following

```
Compiling hello.c
...
hello.obj - 0 error(s), 0 warning(s)
```

If there are any warnings, you may ignore them for now (or ask your instructor to explain them!) Again from the Solution Explorer, select the hello project (the entry in **bold**) and open the context menu, this time selecting the Build option (this is 'Microsoft' for Link!) . Verify that you get no errors and no warnings. You should see the following

```
Linking...
Hello.exe - 0 error(s), 0 warning(s)
```

From the Debug menu select *Start Without Debugging (Ctrl + F5).* Verify that a new command window appears containing the text `"Welcome to QA Training"`. Hit any key to return to programming environment.

2. Stay inside the Visual Studio environment. You are going to open a new project file. You do not need to close the old project (menu File Close Solution), by all means save if asked to, but you can ignore/cancel this message.

From the *File* menu select *Open Project/Solution...*. From the dialog box select **numbers.sln** from the `c:\qacprg\cnotes` directory. You should see the program from slide 8.

As before, Compile and Build (i.e. Link) and execute (or simply hit the Control-F5 shortcut, which will automatically compile and link and execute the program – although it may ask you if you wish to create numbers.exe as it does not already exist). Once again a window will appear displaying the prompt

```
Please input two numbers:
```

type in any two numbers (separated by whitespace) and hit return. The sum of the two numbers should be displayed. Again, hit any key to return to the programming environment. Run the program a few times with a variety of inputs.

Edit the statement

```
result = x + y;
```

in **Numbers.c** so that it calculates the product of the two numbers. Build and run again. Run the program a few times with a variety of inputs.

Linux

Note: the use of Linux is optional, but assumes a basic knowledge of using the command-line. You can use whatever editor you are happy with, but if in doubt we suggest `gedit` or `kate`, both of which support C syntax highlighting.

1. Change your current directory to `/home/user1/qacprg/CNOTES`. Open **`hello.c`** using an editor, you should see the following program onscreen.

```
#include <stdio.h>
int main(void)
{
    printf("Welcome to QA Training\n");
    return 0;
}
```

From the shell command-line, type:

```
make hello
```

Verify that you get no errors and no warnings. You should see the following:

```
cc ./hello.c -o ./hello
```

Now run the program from the command-line:

```
./hello
```

Verify that the text `"Welcome to QA Training"` appears.

2. Now from the same CNOTES directory, using an editor, look at **numbers.c**. You should see onscreen the program from slide 8. Build the numbers program using:

```
make numbers
```

Then run the compiled program using `./numbers`

At the prompt

```
Please input two numbers:
```

type in any two numbers (separated by whitespace) and hit return. The sum of the two numbers should be displayed. Run the program a few times with a variety of inputs.

Edit the statement

```
result = x + y;
```

in **`Numbers.c`** so that it calculates the product of the two numbers. Build and run again. Run the program a few times with a variety of inputs.