Writing your first program

Follow these steps, copying the code exactly as it is listed, to create a simple C++ program that will output the traditional first program greeting:

1. Open a plain text editor, such as Windows’ Notepad, then type these “preprocessor directives”
   ```
   #include <iostream>
   using namespace std ;
   ```

2. A few lines below the preprocessor directives, add a “comment” describing the program
   ```
   // A C++ Program to output a greeting.
   ```

3. Below the comment, add a “main function” declaration to contain the program statements
   ```
   int main()
   {
   }
   ```

4. Between the curly brackets (braces) of the main function, insert this output “statement”
   ```
   cout << “Hello World!” << endl ;
   ```

5. Next, insert a final “return” statement in the main function
   ```
   return 0 ;
   ```

6. Save the program to any convenient location as “hello.cpp” – the complete program should look like this:

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

// A C++ Program to output a greeting.

int main()
{
    cout << “Hello World!” << endl ;
    return 0 ;
}
```
The separate parts of the program code on the opposite page can be examined individually to understand each part more clearly:

- **Preprocessor Directives** – these are processed by the compiler before the program code, so must always appear at the start of the page. Here, the `#include` instructs the compiler to use the standard C++ input/output library named `iostream`, specifying the library name between `< >` angled brackets. The next line is the “using directive” that allows functions in the specified namespace to be used without their namespace prefix. Functions of the `iostream` library are within the `std` namespace – so this using directive allows functions such as `std::cout` and `std::endl` to be simply written as `cout` and `endl`.

- **Comments** – these should be used to make the code more easily understood by others, and by yourself when revisiting the code later. In C++ programming, everything on a single line after a `//` double-slash is ignored by the compiler.

- **Main function** – this is the mandatory entry point of every C++ program. Programs may contain many functions, but they must always contain one named `main`, otherwise the compiler will not compile the program. Optionally, the parentheses after the function name may specify a comma-separated list of “argument” values to be used by that function. Following execution, the function must return a value to the operating system of the data type specified in its declaration – in this case, an `int` (integer) value.

- **Statements** – these are the actions that the program will execute when it runs. Each statement must be terminated by a semi-colon, in the same way that English language sentences must be terminated by a period (full stop). Here, the first statement calls upon the `cout` library function to output text and an `endl` carriage return. These are directed to standard output by the `<<` output stream operator. Notice that text strings in C++ must always be enclosed within double quotes. The final statement employs the C++ `return` keyword to return a zero integer value to the operating system – as required by the main function declaration. Traditionally, returning a zero value indicates that the program executed successfully.