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

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

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

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

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

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

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

// A C++ Program to output a greeting

int main()
{
    cout << "Hello World!" << endl;
    return 0;
}
```
The C++ compiler also supports multiple-line C-style comments between /* and */ – but these should only ever be used in C++ programming to “comment-out” sections of code when debugging.

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 full stop period. 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.