Structure of a C++ Program

C++ has a very defined structure and way of doing things. Miss something out, even as small as a semicolon, and your entire program will fail to be compiled and executed. Many a professional programmer has fallen foul of sloppy structure.

#INCLUDE <C++ STRUCTURE>

Learning the basics of programming, you begin to understand the structure of a program. The commands may be different from one language to the next, but you will start to see how the code works.

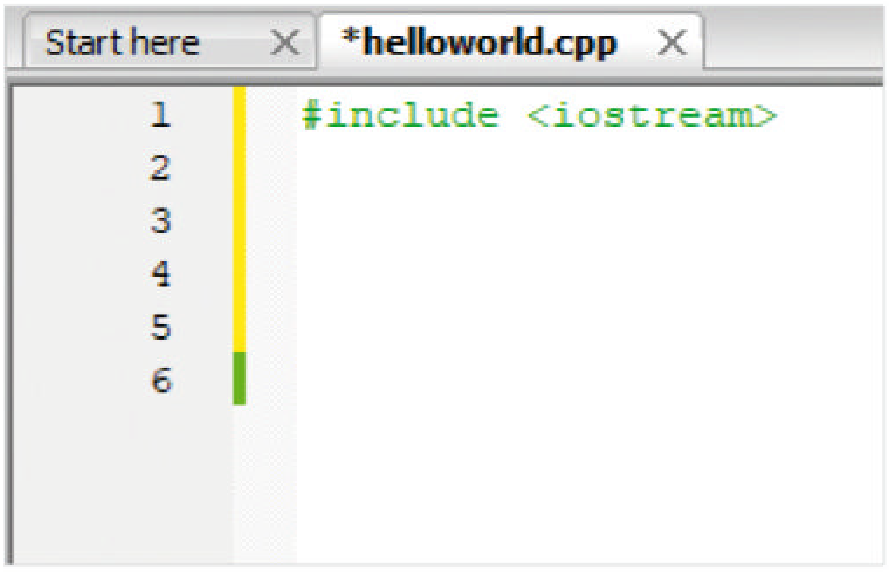
C++

C++ was invented by Danish student Bjarne Stroustrup in 1979, as a part of his Ph.D. thesis. Initially C++ was called C with Classes, which added features to the already popular C programming language, while making it a more user-friendly environment through a new structure.

Bjarne Stroustrup, inventor of C++.

#INCLUDE

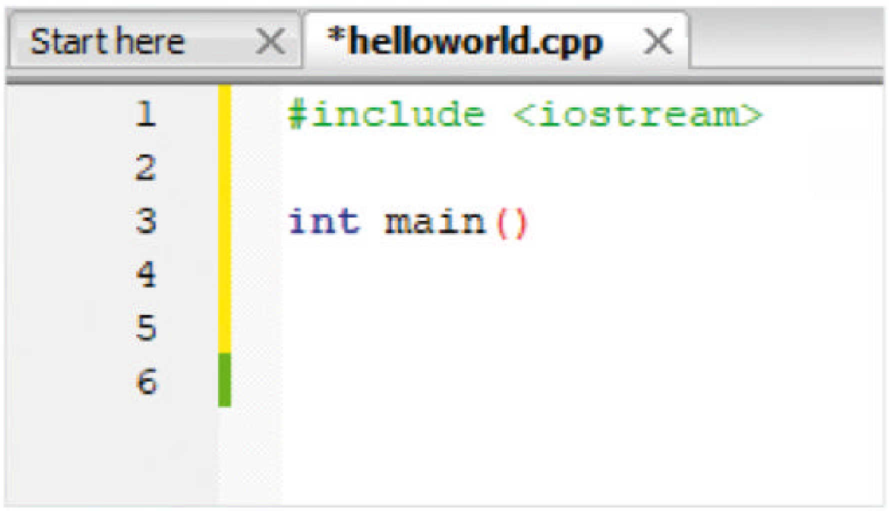
The structure of a C++ program is quite precise. Every C++ code begins with a directive: **#include <>**. The directive instructs the pre-processor to include a section of the standard C++ code. For example: **#include <iostream>** includes the iostream header to support input/output operations.



```
#include <iostream>
```

INT MAIN()

int main() initiates the declaration of a function, which is a group of code statements under the name 'main'. All C++ code begins at the main function, regardless of where it actually lies within the code.

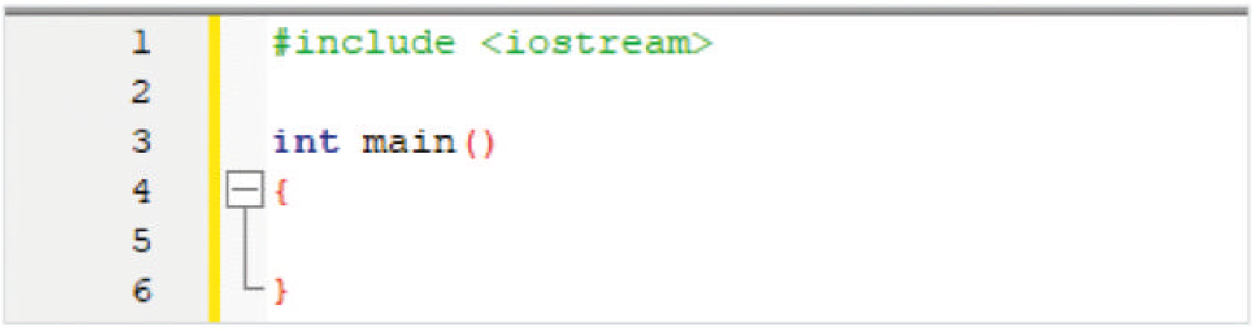


```
#include <iostream>

int main()
```

BRACES

The open brace (curly brackets) is something that you may not have come across before, especially if you're used to Python. The open brace indicates the beginning of the main function and contains all the code that belongs to that function.



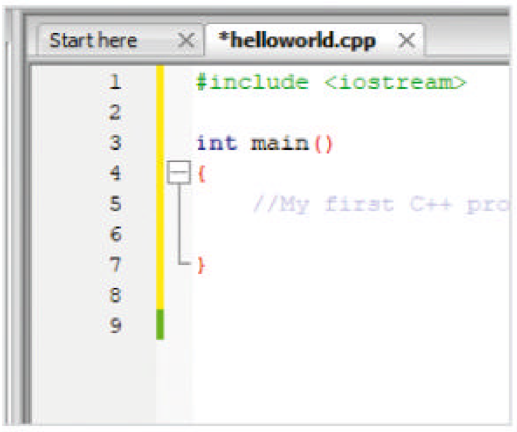
```
#include <iostream>

int main()
{

}
```

COMMENTS

Lines that begin with a double slash are comments. This means they won't be executed in the code and are ignored by the compiler. Comments are designed to help you, or another programmer looking at your code, explain what's going on. There are two types of comment: /* covers multiple line comments, // a single line. Lines that begin with a double slash are comments. This means they won't be executed in the code and are ignored by the compiler. Comments are designed to help you, or another programmer looking at your code, explain what's going on. There are two types of comment: /* covers multiple line comments, // a single line.



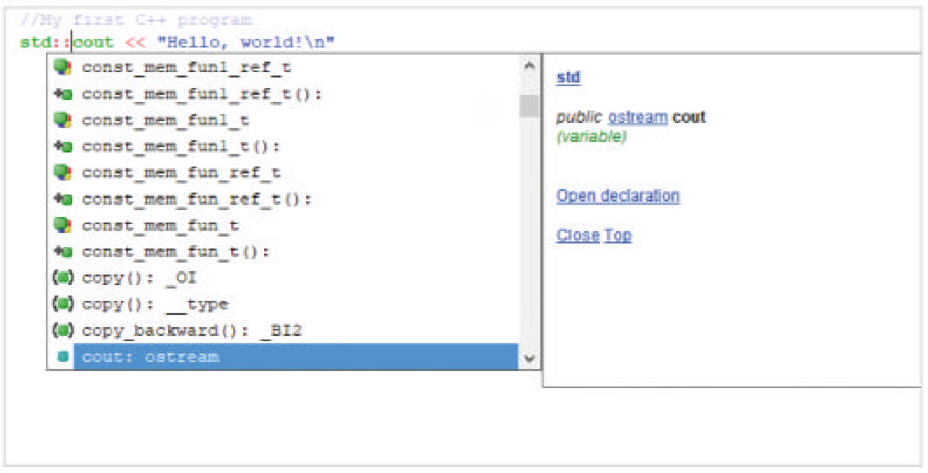
```
#include <iostream>

int main()
{
    //My first C++ pro
}

```

<<

The two chevrons used here are insertion operators. This means that whatever follows the chevrons is to be inserted into the std::cout statement. In this case they're the words 'Hello, world', which are to be displayed on the screen when you compile and execute the code.

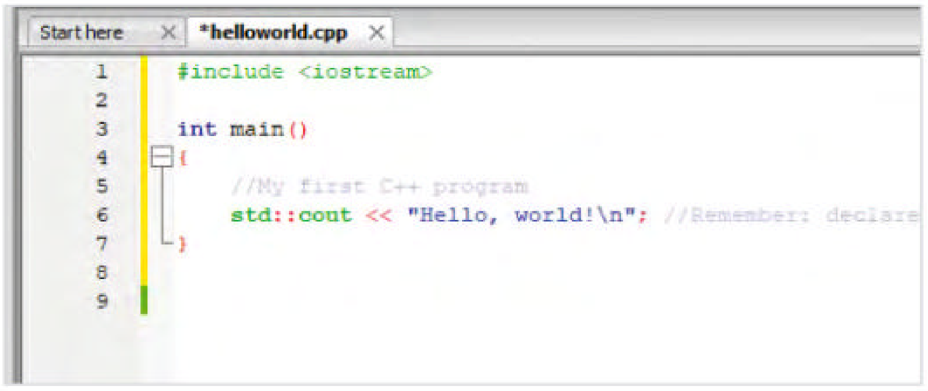


```
//My first C++ program
std::cout << "Hello, world!\n"
    const_mem_fun1_ref_t
    const_mem_fun1_ref_t():
    const_mem_fun1_t
    const_mem_fun1_t():
    const_mem_fun_ref_t
    const_mem_fun_ref_t():
    const_mem_fun_t
    const_mem_fun_t():
    copy(): _OI
    copy(): __type
    copy_backward(): _BI2
    cout: ostream
```

STD

While **std** stands for something quite different, in C++ it means Standard. It's part of the Standard Namespace in C++, which covers a number of different statements and commands. You can leave the **std::** part out of the code but it must be declared at the start with: **using namespace std**; not both. For example:

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



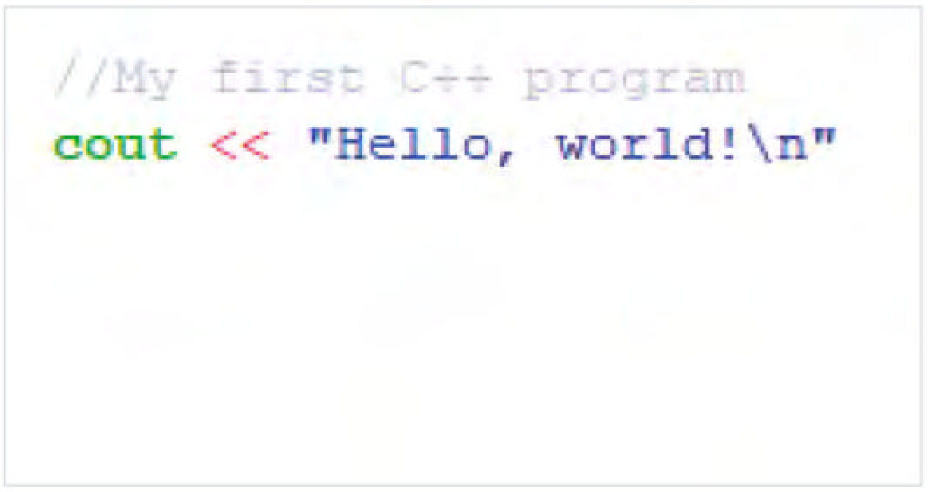
```
#include <iostream>

int main()
{
    //My first C++ program
    std::cout << "Hello, world!\n"; //Remember: declare
}

```

OUTPUTS

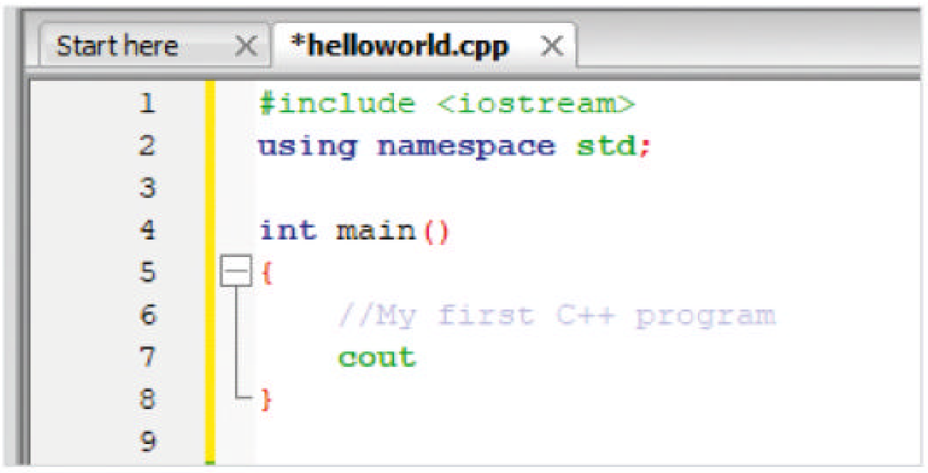
Leading on, the "Hello, world!" part is what we want to appear on the screen when the code is executed. You can enter whatever you like, as long as it's inside the quotation marks. The brackets aren't needed but some compilers insist on them. The \n part indicates a new line is to be inserted.



```
//My first C++ program
cout << "Hello, world!\n"
```

COUT

In this example we're using cout, which is a part of the Standard Namespace, hence why it's there, as you're asking C++ to use it from that particular namespace. Cout means Character OUTput, which displays, or prints, something to the screen. If we leave **std::** out we have to declare it at the start of the code, as mentioned previously.



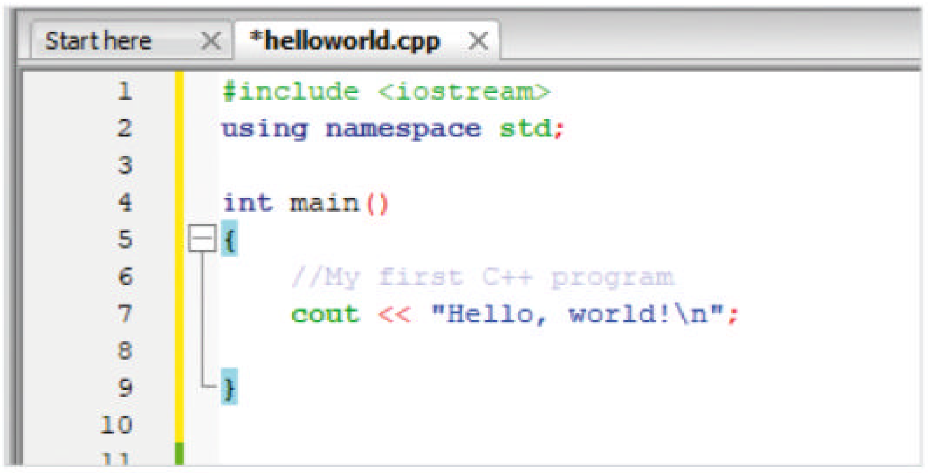
```
#include <iostream>
using namespace std;

int main()
{
    //My first C++ program
    cout
}

```

; AND }

Finally you can see that lines within a function code block (except comments) end with a semicolon. This marks the end of the statement and all statements in C++ must have one at the end or the compiler fails to build the code. The very last line has the closing brace to indicate the end of the main function.



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

int main()
{
    //My first C++ program
    cout << "Hello, world!\n";

}

```