

2.3

The #include Directive

CONCEPT: The #include directive causes the contents of another file to be inserted into the program.

Now is a good time to expand our discussion of the #include directive. The following line has appeared near the top of every example program.

```
#include <iostream>
```

The header file `iostream` must be included in any program that uses the `cout` object. This is because `cout` is not part of the “core” of the C++ language. Specifically, it is part of the *input-output stream library*. The header file, `iostream`, contains information describing `iostream` objects. Without it, the compiler will not know how to properly compile a program that uses `cout`.

Preprocessor directives are not C++ statements. They are commands to the preprocessor, which runs prior to the compiler (hence the name “preprocessor”). The preprocessor’s job is to set programs up in a way that makes life easier for the programmer.

For example, any program that uses the `cout` object must contain the extensive setup information found in the `iostream` file. The programmer could type all this information into the program, but it would be too time consuming. An alternative would be to use an editor to “cut and paste” the information into the program, but that would still be inefficient. The solution is to let the preprocessor insert the contents of `iostream` automatically.



WARNING! Do not use semicolons at the end of preprocessor directives. Because preprocessor directives are not C++ statements, they do not require them. In fact, in many cases an error will result if a preprocessor directive is terminated with a semicolon.

An `#include` directive must always contain the name of a file. The preprocessor inserts the entire contents of the file into the program at the point it encounters the `#include` directive. The compiler doesn’t actually see the `#include` directive. Instead it sees the code that was inserted by the preprocessor, just as if the programmer had typed it there.

The code contained in header files is C++ code. Typically it describes complex objects like `cout`. Later you will learn to create your own header files.