1] COMPILING YOUR FIRST PROGRAM

a) Log into the laboratory machine under Unix, not Windows.

b) Save the file `hello.cpp` to the desktop.

c) Open a Unix terminal session. To do this right click the screen and select `Open Terminal`.

d) Type
```
ls
```
This will list files and sub-directories in your current directory.

e) Open `hello.cpp` with your favourite text editor. Study the code and see if you can work out what it does.

f) Type
```
g++ hello.cpp
```
This will compile `hello.cpp` using the g++ compiler to form the executable.

g) Type
```
ls
```
Note there is a new file called `a.out`

h) Type
```
./a.out
```
and see what happens.

Congratulations! You have just compiled and run your first C++ program.

2] DEBUGGING YOUR FIRST PROGRAM

a) In the text editor delete the `;` at the end of the `cout` line and then save the file.

b) Recompile the saved program. Note the error printed.

```
hello.cpp: In function 'int main()':
hello.cpp:9: error: expected `;' before 'return'
```

The program has failed to compile. This means that by the time it started compiling line 9 there was something wrong. The error may be on the line mentioned but can often be due to an error in the line before. In this case the missing `;` on line 7.

c) When g++ compiles it will produce two types of errors
- *Warnings* mean there is something suspicious but still acceptable.

- *Errors* mean there is something definitely wrong.

g++ will try and tell you where the problem occurred and what it was.

The error (or *bug*, as it is usually called) you have created is called a *syntax* error. They are usually easy to fix since the compiler tells you about them. Much harder to fix are *logical* errors. Programs with these errors compile but contain a logic error that makes the program behave in unexpected ways.

We will discuss techniques for finding and fixing logical bugs later in the subject. Getting rid of bugs in your code is called *debugging*. As you learn to program in C++ you will spend a lot of time debugging your code. The more you practice programming the less errors you will make and the easier they will become to solve. Therefore - PRACTICE LOTS!

d) Replace the deleted `;` and place a `//` before `using namespce std;`
Recompile the code and see what happens.

```
hello.cpp: In function 'int main()':
hello.cpp:7: error: 'cout' was not declared in this scope
```

The compiler doesn't know where to find `cout`.
Change the `cout` to `std::cout` and then compile.

The `::` is called the scope resolution operator and allows the compiler to know that `cout` is part of the `std` namespace.

3] COMPILING YOUR SECOND PROGRAM

a) Save the file `typemix.cpp` to your home directory

b) Study the code and see if you can work out what it does.

c) Compile and run this program. Note the warning messages generated.

d) Do you understand why it produces the output it does?