

Getting Started



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How Text Becomes Executable

**A compiler takes source code
you can read and write**

**Transforms it into a different
format**

**The compiler gives you error
messages**

**The output is generally called an
object file**



How Text Becomes Executable



Any program larger than a demo is made of several source files

Each is compiled, then the object files are linked together to create an executable file (exe)

- In some projects, you would create a library file instead
- The linker gives you error messages if it can't link the objects

Finally you run the application

- There may be runtime messages or dialogs from the operating system, or that you wrote yourself



C++ is Unusual

- ➡ The language does not “belong” to a single vendor
- ➡ Tools are available from many sources at many price levels
- ➡ All vendors try to implement the standard
- ➡ ISO Committee
- ➡ Standard updates every 3 years



What Tools Do You Need?

Bare minimum:

- Text editor
- Compiler (clang, gcc, etc)
- Linker

Nice additions

- Code-aware editor
- Debugger
- Code-specific tools: static analysis, diagramming tools etc
- Libraries and Frameworks



Free Tools



Windows

- Visual Studio Community
- MinGW (not an IDE)

Mac

- XCode

Cross Platform

- Visual Studio Code
- Qt Creator
- clang (not an IDE)
- gcc (not an IDE)

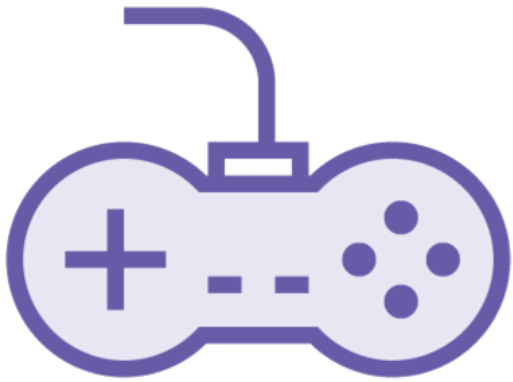
What Can You Write?

C++ targets ALL platforms

- Windows, Mac, Linux
- Phones
- Embedded (Robots, IoT etc)



Different Coding Patterns and Libraries



Games



High
performance /
low latency



Server / no UI



Corporate GUI

All based on the common
syntax and standard
libraries



Command Line

Run in a “console” or
“terminal” or “shell”

Outputs characters to
the screen

Input is from user typing
characters

No graphics, sound, etc

Makes a good “common
denominator”



Smallest C++ Application

```
int main()  
{  
    return 0;  
}
```

Case sensitive

{ and } are not (and)
Begin and end must
match

; at end of most lines

Not all applications are
main()

Compiler errors



Compiler assumes you are trying to make sense

- Error message can sometimes be misleading

Not all the errors you can get when you build are compiler errors

Compiler also gives warnings

- New developers should not ignore warnings

Summary



There are many C++ compilers available

- This course will use Visual Studio Community
- You can use any one you like

C++ is maintained by a Standards Committee

To “build” your source code into executable code

- First the code is compiled
- If that succeeds the compiler output is linked
- The executable is what you run
 - From inside Visual Studio
 - From a command prompt
 - By double-clicking

Console applications have a particular structure you must follow

