

Getting Started

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Course Overview

- **Getting Started**
- **Stream IO, Local Variables, Flow of Control**
- **Functions and Headers**
- **Strings and Collections**
- **Compiler-Specific Topics**
- **Writing Classes**
- **Topics to Learn Later**
- **Legacy Constructs**

Getting Started

- **Compilers, linkers, and tools**
 - Visual Studio 2012 Express for Desktop
 - Mingw and gcc for Windows
 - Clang and gcc for Linux
- **What a C++ application looks like**
- **Compiling, linking, building**
- **Running your application**

How Text Becomes Executable

- **A compiler takes source code you can read and write, and transforms it into a different format**
 - The compiler gives you error messages if it can't compile your code
 - The output is generally called an object file
- **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

What Tools Do You Need?

- **Bare minimum:**

- Text editor (Notepad, vi, emacs...)
- Compiler
- Linker

- **Nice additions**

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

Command Line

- **C++ is older than Windows, or any other currently-used mouse-and-windows UI**
- **The oldest C++ applications run at the command line in DOS or Unix**
 - Can be simulated on modern operating systems
- **Console applications are the simplest to write**
 - Lets us focus on language syntax

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 Express for Desktop
 - 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**