



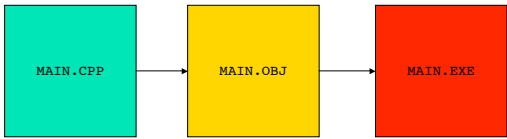
Lecture Supplement

Building C++ Programs

Building a C++ Program

- A C++ Program consists of
 - Source files
 - Header files
- Source Files
 - Usually have a .cpp or .cp extension
 - Compiled individually
- Header Files
 - Usually have a .h extension (some use of .hpp)
 - Contain declarations which are "included" by source files.
- Let's take a quick look at how a C/C++ program is built
 - "From 10,000 feet" (I'll omit some details to keep it simple)

Building a C++ Program



- MAIN.CPP is a *source* file
 - Contains source code you write.
- MAIN.OBJ is an *object* file
 - Contains object code generated by compiling MAIN.CPP
- MAIN.EXE is an *executable* file
 - Is a "double-clickable" application that may be run. It is created by the *linker* which takes object code and generates executables.

Building a C++ Program

MAIN.CPP

```
int main()
{
// real code here
EventLoop();
}
```

EVENTS.CPP

```
void EventLoop()
{
// real code here
}
```

- Programs may be made up of multiple source files
- When building the program these files are compiled independently.
 - The compiler makes note of which symbols (variables, function names) are **not** defined in the same file.
 - So, when MAIN.CPP is compiled, the compiler makes a note that EventLoop() is (apparently) defined elsewhere...

Building a C++ Program

MAIN.OBJ

```
SYMBOLS DEFINED:
main();

OTHER SYMBOLS REFERENCED:
EventLoop();
```

EVENTS.OBJ

```
SYMBOLS DEFINED:
void EventLoop();
```

- The compiler creates two object files.
- The linker is then called to build an executable out of the object files.
- The linker will be told which object files should be used in creating the exe
- It's the linker's job to make sure symbols referenced from one file (but not defined in that file) are found in other object files.

Building a C++ Program

MAIN.OBJ

```
SYMBOLS DEFINED:
main();

OTHER SYMBOLS REFERENCED:
EventLoop();
```

EVENTS.OBJ

```
SYMBOLS DEFINED:
void EventLoop();
```

SAMPLE.EXE

- When generating SAMPLE.EXE, the linker will notice that "EventLoop" is not defined in MAIN.OBJ. If it can't find that symbol in an other object file, an error will result. Otherwise, if all symbols can be found, the executable will be generated.