

# The Edit-Compile-Run Cycle

EECS 211

Winter 2017

So you've written a program:

```
#include <iostream>

int main()
{
    std::cout << "Hello, world\n";
}
```

What now?

# Compilation

We need to translate our program from

- source code (e.g., C++, human readable)

to

- machine code (machine executable).



## Compilation in the shell

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$ g++ hello.cpp -o hello
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$ cat hello.cpp
#include <iostream>

int main()
{
    std::cout << "Hello, world\n";
}
$ g++ hello.cpp -o hello
$ ./hello
Hello, world!
$
```

# Build management

As programs get larger, builds get more complicated:

- More files to compile, in complex combinations
- Want to just recompile the changed files
- Different compilers/machines want different options and work differently

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We'll use a software building system called CMake to do all this for us

## Getting a CMake project onto EECS

You can download an example CMake project from the course website:

```
$ cd eeecs211
$ wget http://users.eecs.northwestern.edu/~jesse/
      course/eeecs211/lec/cmake-example.zip
:
:
```

(No line break in the wget command—that's one long URL.)

```
$ unzip cmake-example.zip
:
$ cd cmake-example
$ ls
CMakeLists.txt  hello.cpp
$
```

## Setting up CMake

You should have a project directory with a CMakeLists.txt file in it, like from the previous slide. Change to that directory. Then once, to set up CMake:

```
$ cd eecs211/cmake-example
$ mkdir build
$ cd build
$ ~jesse/pub/bin/cmake ..
-- The CXX compiler identification is GNU 5.3.1
:
-- Configuring done
-- Generating done
-- Build files have been written to:
   /home/jesse/eecs211/cmake-example/build
$
```

## Building with CMake

Change directories to the CMake build directory. Use the make command to build, then run your program.

```
$ cd eecs211/cmake-examples/build
$ make hello
Scanning dependencies of target hello
[ 50%] Building CXX object CMakeFiles/hello.dir/
                                     hello.cpp.o
[100%] Linking CXX executable hello
[100%] Built target hello
$ ./hello
Hello, world.
$
```

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Hello, world.
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```

After editing `hello.cpp` you can use `make hello` to build again.