Learning by Example:
A Gentle Introduction to C++

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Lecture 1

Outline

- Course outline
- Sample C++ program
- Basic software engineering
  - Program structure
  - Good style and commenting

Course overview

- You **must** use either Visual Studio Express or Xcode for your program submissions

Programming survey

- Who has programmed before in C++?
  - C?
  - Java?
  - Scheme/Lisp?
  - Python?
  - Basic/Visual Basic/VBA?
  - Fortran?
  - MATLAB?

C++

- Designed in the 1980s by Bjarne Stroustrup as an extension to C
- Fully backwards-compatible with C
- Introduces new object-oriented concepts, templates, and additional language features to C
- C and C++ are efficient *imperative* languages, perfect for systems-level programming
- Lack some of the runtime checks of other languages like Java, making them more difficult to use

Example program

- average.cpp
  - This program reads in numbers from the user and averages them together.

Software Engineering

- The art of making good programs
  - Correct
  - Well-organized
  - Easily understood
  - Reusable

Program organization

- Programs are divided into *preamble* and *function definitions*
- Preamble
  - Conveys information needed to make sense of the functions and objects defined
  - For now:

```
#include <iostream>
using namespace std;
```

- Function definitions give step-by-step instructions to the computer when a *function* is called
  - Special function: main (*not* Main)

```
int main()
{
  //Code goes here
  return 0;
}
```

OR:

```
int main(int argc, char** argv)
{
  //Code goes here
  return 0;
}
```

Creating readable code

- Commenting
  - Text that is not part of the program
  - Often used to describe what code does, how to use it, or other pertinent information
  - May also be used to "deactivate" code, especially during development

- Line comments
  - Start with //, continue until end of line (enter)
  - Can use at the end of a line or before a block of code

- Block comments
  - Start with /*, end with */
  - May span multiple lines
  - Describe what a particular function or class is, how it works, etc.

Tonight

Homework: install Visual Studios Express or Xcode

Recommended reading: Sections 2.1.1-4, 2.1.6, 2.2.1-4, and 2.3.1 in C++ for Everyone