PIC 10A Week 1 (Tues)

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1. Computer Anatomy

2. Programming Language

3. From source code to executable

4. Hello World
What is a computer?

A computer basically consists of the following parts:

- CPU chip
- Memory
  - Fast memory (RAM and ROM)
  - Slow memory (Hard drive)
- Motherboard/Bus
CPU Chip
Memory

**Figure:** RAM

**Figure:** HDD and SDD
Motherboard and Bus

**Figure:** Motherboard

**Figure:** Bus
Figure 5  Schematic Design of a Personal Computer
Programming hierarchy by proximity to the machine

Compilers for high level languages allowed programming to be independent of the processor.
Some programming languages (in no particular order)

- C++
- C
- Java
- Python
- C
- Ruby
- JavaScript
- C#
- PHP
- Objective-C
- SQL
- Go
- Ruby

We’ll be learning C++. 
From source code to executable

From Lecture 2 of Professor Miroshnikov

**Figure 9**  From Source Code to Executable Program
An example of a compiler
This is an example of a \texttt{cc} compiler for the programming language C

\textbf{Figure 1:} The internals of \texttt{cc}.  
myfile.c \hspace{2cm} \texttt{cc} \hspace{2cm} \texttt{a.out}.

\vspace{1cm}

\begin{itemize}
  \item preprocessor
  \item compiler
  \item assembler
  \item linker
\end{itemize}

\vspace{1cm}

\begin{itemize}
  \item object files
  \item libraries
\end{itemize}
Edit-Compile-Debug Loop

Figure 10
Edit-Compile-Debug Loop
Your first program: Hello World

ch01/hello.cpp

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

int main()
{
    cout << "Hello, World!\n";
    return 0;
}
```

Program Run

Hello, World!