CS 161
Intro to CS I

What is programming?
Chap. 1
Odds and Ends

• Class Website (not Canvas)
  – Labs and assignments are posted
  – Lab/recitation times, office and grading hours, and
    TA/instructor information
  – Slides and course videos

• Syllabus (class and recitation)
  – Grade weights, details, dishonesty, etc.
  – Be Proactive!!!
  – Establishing a Positive Community (meet your peers!)

• Assignment #1 posted, due Sunday 11:59pm submit on
  TEACH

• Recitation Quiz #1 posted, due Monday 11:59pm
  (email to TA)
Computers Are Everywhere

• Examples:
  – homes, offices, rooms/servers, phones, pacemakers, cars, etc.

• What is the difference b/w these?
  – Complexity
  – Size

> tradeoffs
What is a computer?

• A Computational Device
  – It computes (input-> processing -> output)
  – Modern: device that can be programmed to carry out an algorithm.

• Computer Science
  – The study of devices that can be programmed
What is an algorithm?

• Step-by-step description of how to accomplish a task, i.e. recipe

• Algorithmic thinking

• Expressed in any language
  – Natural
  – Programming
What is programming?

• Problem Statement
• Solve the Problem
• Specify Algorithm
• Algorithm -> Computer Language

• Why do we teach programming 1st?
Hardware vs. Software

- Computer: **machine** that manipulates data and carries out **set of instructions**
- Hardware
  - CPU
  - RAM
  - Hard Disk
- Software
  - Programs
Software/Programs

• Primary piece of software on computer?
• What is its purpose?
• What are applications?
Digital Realm

• Based on discrete #s
  – Specifically: Circuits

• Binary, i.e. base 2
  – 0 or 1

• What base do most people use?
  – What is the range for each digit?

• What is Hexadecimal?, i.e. base 16
  – What is the range for each digit?
Decimal, Binary, & Hex

- Decimal
  - Powers of 10
- Binary
  - Powers of 2
- Base X to Base 10 conversion
  - 32 (base 10): $3 \times 10^1 + 2 \times 10^0 = 32$ (base 10)
  - 100000 (base 2): $1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 32$ (base 10)
  - How do we express 35 (base 10)
    - base 2
    - base 16
```cpp
#include <iostream> // this is to print and read info
#include <climits> // this is to access INT_MAX

using namespace std;

int main() {
    cout << INT_MAX << endl;
    return 0;
}
```

3 libraries

main function where execution begins

print largest possible number that can be stored in an integer type (int)
Quick Demo...

Compile program to make an executable program

Output from cout

Run program
Reading/Assignments

• Read/Start Assignment 1 and Recitation Quiz
• Read Chap. 1 of online books!!!
• Recitations, Labs, and Office Hours are happening this week.
• Laptop required for Lab.
• Assignments must compile and run on ENGR!
• Demos start next week (no laptop required).
• Sign-up for demo on home page, after you submit your assignment.
• Don’t be scared!!!!