CS 161
Intro to CS I

Beginning to Program
Odds and Ends

• Assignment #1 due Sunday.
• Don’t forget to sign up for a demo.
• Finish reading about variables and expressions.
• Begin reading about conditional execution, i.e. if/else blocks.
Precedence

• What is precedence?
  – Binding power of operator
  – (*, /, %) vs. (+, -)

• How do we override precedence?
  – Parenthesis!

• Examples:
  12 * 4 + 6 * 10 vs. ((12 * 4) + 6) * 10
• Integer Arithmetic
  std::cout << 3/8;   /*prints 0*/
  std::cout << 34/5;  /*prints 6*/

• Floating Point Arithmetic
  std::cout << 34.0/5.0;  /*prints 6.8*/
  std::cout << 3.0/8;  /*prints .375*/
  std::cout << 3/8.0;  /*prints .375*/
Type Casting

• Casting
  
  std::cout << 34 / (int) 5.0; /*prints 6*/
  std::cout << (int) (34 / 5.0); /*prints 6*/
  std::cout << (float) 34 / 5; /*prints 6.8*/

• What is wrong with these?
  std::cout << (int) 34 / 5.0; /*prints 6.8*/
  std::cout << (float) (34/5); /*prints 6.0*/
Demo...
How do we read into a variable in C++?

• Declare a variable

• Read value from user and store at variable location

• How do we do this?

```cpp
#include <iostream>

int main() {
    int x;
    std::cin >> x;
    std::cout << x;
    return 0;
}
```
Demo...
Get into groups of 4-5

• How are you converting a 4 bit binary number to decimal number using no strings, conditionals, repetition, or built-in functions?
New Operators for Expressions

• What if you have the statement `var = var + 1;` `var += 1; /*Add operand on right to var*/` `var++;  /*Increment var by one*/`

• What if you have the statement `var = var - 5;` OR `var = var + var;`
  `var -= 5;`
  `var += var;`

• Pre vs. Post increment: `++var` vs. `var++`
Demo...
Decisions in Life

• What is a decision?
• When do we make decisions?
• How do we make decisions?
  If it is sunny today
   then I’ll go to the beach and fly a kite
  Else if it is raining today
   then I’ll stay inside and read a book
  Else if it is snowing
   then I’ll go to the mountains to ski
Decisions within Decisions

• What happens if there is no wind at the beach?

• How does this change our decisions?
  If it is sunny today
    then I’ll go to the beach
  if it is windy at the beach
    then I’ll fly a kite
  if it is not windy at the beach
    then I’ll walk on the shore
Flow chart for decisions

1. **Is it sunny?**
   - Yes: Go to beach
   - No: **Is it raining?**
     - Yes: Read book
     - No: Go outside

2. **Is it windy?**
   - Yes: Fly kite
   - No: Walk on beach
Decisions in our programs

• Use an if/else
  
  if (<expression>) {
    <statement>;
    ...
    <statement>;
  }
  else {
    <statement>;
    ...
  }