Announcements

- Second program due tomorrow night.
- If you want to run a program one line at a time, like I did at the end of class last time:
  - This is called "stepping through" a program
  - For Windows, see the PyScripter program on the Software page of the class Web site. You can install this, and one of the things it does is step through programs.

Malformed if statements

- if name = "":
  - print "Welcome!"
- if answer == ""
  - print "Welcome!"
- if answer == "":
  - print "Welcome!"

- Uses = instead of ==
- Missing :
- No indentation

Nested if statements

if today == "y":
  if yesterday == "y":
    print "Doin' good!"
  else:
    print "Try harder!"
else:
  print "Try harder!"

Boolean expressions

- today == "y"

- Values of Boolean expressions are either True or False
- Boolean is a new data type.
- We now have four data types (and four kinds of expressions):
  - integer, floating point, string and Boolean.

Boolean expressions

- Have value True or False
- Examples:
  - today == "y"
  - x < 30
  - 2+2 == 4
  - 2+2 <= 5
  - "cat" !="Cat"
Boolean algebra
- Named after George Boole (1815-1864)
- Main idea: you can write down logic as mathematical formulas.
- His book: *An Investigation into the Laws of Thought*
- Computers do logical as well as numerical and string computation.

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True and False
- These are the only two possible Boolean data items.
- NOT descriptions of expressions; actual data.
- Maybe better names would be Truth and Falsehood, so we think of them as things.
- We can store True and False in variables, just like other data.

and and or
- and and or are operators on Boolean data

```python
>>> 5+6
11
>>> (2<3) and (1<3)
True
```
- The value of a Boolean operation is Boolean (True or False)

or

```python
>>> True or True
True
>>> True or False
True
>>> False or True
True
>>> False or False
False
```
Memorize this!

Booleans simplify this program

```python
if today == "y":
    if yesterday == "y":
        print "Doin' good!"
    else:
        print "Try harder!"
else:
    print "Try harder!"
```
Converting types

\[
\text{int('5')/2}
\]
- Converts the string '5' to the integer 5

---

Converting Data

- Convert an integer to a string:
  
  \[
  x = \text{str}(10)
  \]
  - \(x\) gets the string '10'

- Convert a floating point number to a string:
  
  \[
  y = \text{float}('8.3333')
  \]
  - \(y\) gets the floating point number 8.333

---

Getting numbers from the user

```
reply = \text{raw_input('Feet: ')}
feet = \text{int}(reply)
reply = \text{raw_input('Inches: ')}
inches = \text{int}(reply)
```
- Notice we use the variable reply twice.
- When we put the second string into reply, the first one gets written over. It's gone!

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Body mass index

Kilograms / (meters\(^2\))

- Or, in 'English Imperial Units'

\[
\frac{(\text{Pounds} \times 703)}{(\text{inches}^2)}
\]
- 25 or greater is overweight.

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Yao Ming

- 7 feet, 6 inches. 310 pounds.