**CIS 210 Review**

What have we learned, anyway?

---

**Goals for CIS 210**

- Learn computer science concepts
  - Problem solving with computation
- General programming skills
  - Includes designing programs to be understood and modified by humans
  - Includes testing, debugging
- Expressing programs in Python
  - But the programming concepts apply to other languages

---

**Schedule**

Today, Friday: Review
- Sudoku solver due today; contest entry due tonight; Optional assignment due Friday
- I cannot be at office hours today. Not sure about Noah (he’s been ill).
- Wednesday 2012.12.5 3:15-5:15 Final exam
**Things to expect**

Functions and methods:
- Scope, parameter passing, returning results
- Boolean values
- Recursion
- Loop design
- Classes/objects/modules

In the “what does this print” part
and in the “write a function/method to do x” part

---

**Winter 2012 as model ...**

Differences:
- We haven’t studied subclasses and inheritance
- We have studied functions as objects
  (and we’re using Python)

---

**Winter 2012 Q1 (in Python):**

```python
def q1():
    x = 3
    y = 5
    if x > y:
        x = x // 2
    else:
        y = y // 2
    if x > y:
        x = x // 2
    else:
        y = y // 2
    print(x, y)
```

**Winter 2012 Q1 (in Python):**

```python
def q1():
    x = 3
    y = 5
    if x > y:
        x = x // 2
    else:
        y = y // 2
    if x > y:
        x = x // 2
    else:
        y = y // 2
    print(x, y)
```
W12 Q2:

def win(ar, low, high):
    count = 0
    for el in ar:
        if el > low and el < high:
            count += 1
    return count

def q2():
    vals = [ 2, 3, 4, 5, 6, 7, 8, 9, 10 ]
    winners = win(vals, 4, 7)
    print(winners)

W12 q3:
This is about subclasses, inheritance, dynamic dispatch. Python has them. We haven’t studied them.

It’s also about monsters. We’ve been more concerned with zombies and aliens, although I do like to use Totoro whenever possible.

2012W Q4 (loop design)

def present(ar, v):
    """Determine whether v is in array.
    Arguments:
    ar: a list
    v: an integer
    Returns:
    True if v is an element of ar.
    """
    ## Solve without Python library functions
    ## for searching lists

2012W Q5
Linked list problem, with objects.
We haven’t studied that exactly, but we have studied shared references (e.g., cols and squares containing the same Tile objects in the Sudoku board).
This might be in the “what does it print” section.
2012W Q6 (similar to our optional assignment)

def count_leaves( ar):
    """Count all the non-list objects in ar.
    Arguments:
    ar: a (nested) list structure
    Returns:
    The number of leaf (non-list) elements in ar
    Ex: count_leaves([a, [b, c, [d, e], f]]) = 6
    """