Announcements

- Next Reading and RQ due Nov 1
- Assignment 5 due today
  - Next Assignment out next week
- APT 6 due Tues

Today:
- Review nested loops, tuple generators
- Focus on problem solving with sets

Review from last time: generator

```
im.getdata(), accessing pixels
```

- Returns something like a list
  - Use: `for pix in im.getdata():`
  - Generates pixels on-the-fly, can't slice or index unless you use `list(im.getdata())`
  - Structure is called a Python generator!
  - Saves on storing all pixels in memory if only accessed one-at-a-time

Review from last time

Making Tuples and Generators

- Overuse and abuse of parentheses
  - To create a tuple, use parentheses
    ```python
    for pix in im.getdata():
      (r,g,b) = pix
      npx = (255-r,255-g,255-b)
    ```
  - To create a generator use parentheses as though creating a list comprehension!

- See this in PyDev console

```
[2*n for n in range(10000)]
[2*n for n in range(10000)]
```
Set Operations from pictures
bit.ly/101f16-1027-1

Question: Which operation does the red represent?

A) [Diagram of two overlapping circles]
B) [Diagram of one circle inside another]
C) [Diagram of two non-overlapping circles]
D) [Diagram of two circles with one circle inside the other]
E) [Diagram of two circles with one circle overlapping the other]

Problems — snarf setExample.py

- Given a list of strings that have the name of a course (one word), followed by last names (one word each) of people in the course:
  1. Find total number of people taking any course
  2. Find number of people taking just one course

"econ101 Abroms Curtson Williams Smith", "history230 Black Wrigley Smith", ...

Process data — create lists of strings of names for each course

Data for example


TO easier format to work with:

Part 1 — processList
bit.ly/101f16-1027-2
• Given a list of strings that have the name of a course (one word), followed by last names of people in the course:
  – Convert list into lists of strings of names for each course

["econ101 Abroms Curtson Williams Smith",
"history230 Black Wrigley Smith", ...
]
[‘Black’, ‘Wrigley’, ‘Smith’, …] ]

Part 2 — peopleTakingCourses
bit.ly/101f16-1027-3
• Given a list of lists of names, each list represents the people in one course:
  – Find total number of people taking any course
  – peopleTakingCourses should return unique list of names
• Small Example

[[‘Abroms’, ‘Curtson’, ‘Williams’, ‘Smith’],
[‘Black’, ‘Wrigley’, ‘Smith’]]

Answer is 6 unique names
Next, find the number of people taking just one course

To solve this problem

- First let’s write a helper function
Part 3 – unionAllSetsButMe

bit.ly/101f16-1027-4

- Given example, a list of sets of strings, and the index of one of the sets, return the union of all the sets but that one

example = [set(["a", "b", "c"]), set(["b", "c", "d", "g"]), set(["e", "d", "a"])]
unionAllSetsButMe(example, 1) is set(["a", "b", "c", "e", "d"])

Part 4 – peopleTakingOnlyOneCourse

bit.ly/101f16-1027-5

- Given a list of lists of strings of names representing people from courses
  - Find number of people taking just one course

[[‘Abroms’, ‘Curtson’, ‘Williams’, ‘Smith’],
4

APT - UniqueZoo

- How do you solve this problem?
- How is it similar to the problem we just solved
Example Data for UniqueZoo

["zebra bear fox elephant", "bear crocodile fox", "rhino elephant crocodile kangaroo", "elephant bear"]