Announcements

• Reading and RQ7 due next time
• Assignment 3 due Tuesday
• APT 2 due today, APT 3 out
• APT Quiz 1 – Sunday night-Tuesday night
  – Up for two days, you pick 3 hours to do it
  – Practice quiz out late today or tomorrow
• Today
  – Designing programs to draw with turtles
  – Calculating info about earthquake data
  – Really doing? (Functions, if, strings, lists)
Given a string of words, this function should return a new string with ‘s’ removed at the end of every word.

bit.ly/101s17-0202-1

def removePlurals(phrase):
    answer = ""
    alist = phrase.split()
    for word in alist:
        if word[-1] == "s":
            answer = word[:-1] + " "
        else:
            answer = word + " "
    return answer.strip()
See Wikipedia and lynnconway.com

- Joined Xerox Parc in 1973
  - Revolutionized VLSI design with Carver Mead

- Joined U. Michigan 1985
  - Professor and Dean, retired '98

- NAE '89, IEEE Pioneer '09

- Helped invent dynamic scheduling early '60s IBM

- Transgender, fired in '68

Lynn Conway
Assignment 3

• Turtles
  – Creative

• Earthquakes
  – Data from last 30 days around the world
  – Example - Find the largest earthquake

```python
import turtle
wn = turtle.Screen()

def square (alex):
    alex.forward(100)
    alex.left(90)
    alex.forward(100)
    alex.left(90)
    alex.forward(100)
    alex.left(90)
    alex.forward(100)
    alex.left(90)

if __name__ == '__main__':
    timmy = turtle.Turtle()
    square(timmy)
    wn.exitonclick()
```

- Run in eclipse
- Make square with different sizes?
- Make a rectangle?
- Where is the repetition?
- New commands:
  - `up()`, `down()`, `position()`, `goto()`
EarthQuake
bit.ly/101s17-0202-3

def quakesMystery(letter, quakes):
    loclist = []
    for item in quakes:
        if letter in item:
            loclist = loclist + [item]
    return loclist

eqList = ['2.4, 14km WSW of Willow, Alaska',
          '0.9, 4km NNW of The Geysers, California',
          '2.1, 13km ESE of Coalinga, California',
          '4.1, 8km E of Maltignano, Italy',
          '1.4, 17km N of Meadow Lakes, Alaska',
          '0.7, 28km SW of Hawthorne, Nevada',
          '1.8, 41km W of Anchorage, Alaska']
EarthQuake (cont)

```python
def quakesMystery2(quakes):
    temp = ""
    for item in quakes:
        if len(item) > len(temp):
            temp = item
    return temp
```

eqList = ['2.4, 14km WSW of Willow, Alaska',
          '0.9, 4km NNW of The Geysers, California',
          '2.1, 13km ESE of Coalinga, California',
          '4.1, 8km E of Maltignano, Italy',
          '1.4, 17km N of Meadow Lakes, Alaska',
          '0.7, 28km SW of Hawthorne, Nevada',
          '1.8, 41km W of Anchorage, Alaska']
Functions you will write

Write a function named `bigQuakes`. This method has two parameters. One is a decimal number and one is a list of earthquake strings in the format above. This method should return a list of earthquake strings whose earthquakes have magnitude equal or greater than the parameter number.

Write a function named `locationQuakes`. This method has two parameters. One is a String representing a place, and one is a list of earthquake strings in the format above. This method should return a list of earthquake strings whose earthquakes were in this location. Assume the location is the last word in the description of the earthquake location.
Calling your Earthquake functions

Assume eqList is a list of all the earthquakes, each earthquake is a string in the correct format.

quakes1 = bigQuakes(1.8, eqList)
quakes2 = locationQuakes(“Alaska”, quakes1)

What can you say about quakes2?
Type, value
Python if statements and Booleans

• In python we have if: else: elif:
  – Used to guard or select block of code
  – If guard is True then code block, else other

• What type of expression used in if/elif tests?
  – ==, <=, <, >, >=, !=, and, or, not, in
  – Value of expression must be either True or False
  – Type is bool - George Boole, Boolean,

• Examples with if
  – String starts with vowel
    (useful for APT Emphasize)
Four versions of isVowel?
bit.ly/101s17-0202-4

A

```
def isVowel(ch):
    if ch == 'e':
        return True
    if ch == 'a':
        return True
    if ch == 'i':
        return True
    if ch == 'o':
        return True
    if ch == 'u':
        return True
    return False
```

B

```
def isVowel(ch):
    c = "aeiou".count(ch)
    if c > 0:
        return True
```

C

```
def isVowel(ch):
    return "aeiou".count(ch) > 0
```

D

```
def isVowel(ch):
    if ch in "aeiou":
        return True
    else:
        return False
```
Anatomy of a Python String

• String is a sequence of characters
  – Functions we can apply to sequences: len, slice [:], others
  – Methods applied to strings [specific to strings]
    • st.split(), st.startswith(), st.strip(), st.lower(), …
    • st.find(), st.count()

• Strings are immutable sequences
  – Characters are actually length-one strings
  – Cannot change a string, can only create new one
  • What does upper do?
    – See resources for functions/methods on strings

• Iterable: Can loop over it, Indexable: can slice it
Incremental + : numbers and strings

- What vowels can you still read this sentence?
  - Create a no-vowel version of word
  - Examine each character, if it's not a vowel …
  - Pattern of building a string

```python
def noVowels(word):
    ret = ""
    for ch in word:
        if not isVowel(ch):
            ret = ret + ch
    return ret
```
Counting vowels in a string

• Accumulating a count in an int is similar to accumulating characters in a string

```python
def vowelCount(word):
    value = 0
    for ch in word:
        if isVowel(ch):
            value = value + 1
    return value
```

• Alternative version of adding:

```python
value += 1
```
APT Emphasize

- Use a helper function! isVowel(ch)