CS1 Lecture 18 Feb. 27, 2017

- Exam 1 graded. Median: 26/27 (~70%)

# of people	7	16	26	46	51	66	10
Score	<10	10-14	15-19	20-24	25-29	30-34	35+

- Discussion section this week. Points will be awarded as usual (unlike last week)
- HW5 available Wed., due Friday, Mar. 10
- Remember: one “free” 10/10 homework and one 2/2 disc. section.

Today

- Start Ch11 – dictionaries *very important!*

```
def farthestFrom1(goalVal, listOfNumbers):
    g = 0
    h = 0
    for i in listOfNumbers:
        j = abs(i – goalVal)
        if j > g:
            g = i
    return g
```

don't use variable names like this! Much harder to see bugs!

And … farthestFrom2(...), farthestFrom3(...) exam1q6.py

Chapter 11: Dictionaries

- Python supports the extremely useful **dictionary** 'dict' type in Python
- Dictionaries are:
  - collections of key – value pairs
- Similar to but importantly different from lists
  - could think of lists as *ordered* collection of key-value pairs, where the keys are integers 0, 1, 2, …
  - with dictionaries, the collection is *unordered* but the interesting thing is that the *keys can be any immutable values*
  - *E.g.* create dictionary numlegs

    >>> numlegs = { 'frog': 4, 'human': 2, 'ant':6, 'dog':4}

Dictionaries

- create with { k1:v1, k2:v2, …}
- empty dictionary: {}
- retrieve value: dict[key]
- modify (or insert) value for key: dict[key]=value

- one important feature of dictionaries is that they provide *very fast* access (we might discuss *how* later in term) to values associated with keys despite being more flexible (not restricted to integer keys, etc.) than lists (see dicttest.py for speed comparision with lists)

Dictionary operations

- len(d)
- d.keys()
- d.values()
- k in d
- del d[k]
- for key in dict:
- d.get(key, defaultVal) when you don't want possible KeyError for d[key]

But note: no slice – d[key1:key2] doesn't make sense

In lecture 13, we developed letterCounts

Lists make it easy to generalize the printVowelInformation(inputString) function of HW2.

How would you implement printLetterCounts(inputString, letters) that prints the number of occurrences in inputString of each letter in letters?

```
>>> printLetterCounts("This is a sentence containing a variety of letters",
                      "aeiouy")
'This is a sentence containing a variety of letters' has:
    4 'a's
    6 'e's
    5 'i's
    2 'o's
    0 'u's
    1 'y's
    and 32 other letter
```

list version:
lec13letterCounts.py

Redo this with dictionaries

Next Time

More on dictionaries