WBFSB

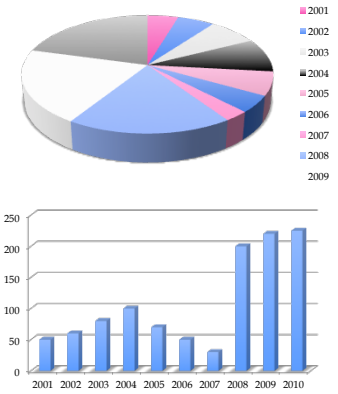
- Plan for this week
  - Get test back, review, look for problems/weaknesses
  - How to address these?
  - Assignments and APTs, reviewing concepts
  - Dictionary: new Python structuring mechanism (set,list)
- Walkthrough for Jotto assignment
  - Start today in class, continue
- What is Computer Science? Why study it?
  - The future belongs to those who can process information?

Jotto: The Program Architecture

- You write `jotto_model.py`
  - This is the guts, brains, state of the program
  - Keeps track of how the game is progressing
  - Functions communicate via global state
    - Maintain state *between* function calls
- We provide two views: command-line and GUI
  - Allow you to *view* and *control* the model
  - Both view-controllers: jotto_commandline.py and jotto_gui.py know about the model, but model doesn't know about them
    - atypical MV/MVC

Model View Controller (MVC)

2001	50
2002	60
2003	80
2004	100
2005	70
2006	50
2007	30
2008	200
2009	220
2010	225



What are global variables?

- Accessible to all functions in a module
  - Declared as `global varname` in functions
    - Mandatory for writing global variables
    - Good idea for reading global variables
  - Defined at 'top' of module for reading code
- Why are global variables are bad idea?
  - Very difficult to reason about correct code
  - Very difficult to extend, modify code
  - Non-locality makes maintenance difficult

Maria Klawe

Chair of Computer Science at UBC, Dean of Engineering at Princeton, *President of Harvey Mudd College*, ACM Fellow,...

Klawe's personal interests include painting, long distance running, hiking, kayaking, juggling and playing electric guitar. She describes herself as "crazy about mathematics" and enjoys playing video games.

"I personally believe that the most important thing we have to do today is use technology to address societal problems, especially in developing regions"

How does this work?

- http://bit.ly/glFvFi
  - URL Shortener, why useful on Twitter?
  - How are URLs stored, searched for, used?
- **Hashing: convert long string to short number**
  - glFvFi is a number!
  - Look up and use!

Count word occurrences: tag cloud

duke basketball Search Instant is or

About 41,000,000 results (0.05 seconds) Advanced search

Cloudlet: **Tags** Sites Net Off Click to try Search Cloudlet with Surf Canyon

alumni archived athletics baseball beat blogs **blue** breaking carolina college complete comprehensive coverage covering dartmouth **devils** devilsillustrated down encyclopedia espn fan favorites feb final **football** free game goduke headlines highlights illustrated independent joint mar **men** **news** north official online recruiting report **schedule** scores site source state team **university** video women

What is a Literary Fingerprint?

- http://www.physorg.com/news179651371.html
- http://iopscience.iop.org/1367-2630/11/12/123015
- **What are some of the issues in creating 'fingerprint'**
  - Where else do fingerprints occur?
  - What is www.shazam.com, www.tineye.com, www.audiblemagic.com, others?
- **How do we go from sets to frequency analysis?**
  - Understanding Python *dictionary* data type

Literary Fingerprint

- Timing and playing with code in fingerPrint.py
  - How do we find out how fast this is?
  - How do we change the format of the output?
  - Can we organize output differently?
- How can we find 'other' fingerprints
  - Shazaam, genome, images
  - What will be the key, what will be the value?

From 10,000 ft to 1 km: Dictionaries

- What is a dictionary? By example
  - 152.3.140.1 is www.cs.duke.edu
  - 157.166.224.26 is cnn.com
  - 68.71.209.235 is espn.go.com
- A collection of (key,value) pairs
  - Look up a key, get an associated value
  - Update the value associated with a key
  - Insert a (key,value) pair
  - Loop over the keys, access pairs or value

A Python view of dictionaries

- A collection of (key,value) pairs that is similar syntactically to a list
  - A list can be accessed by index: a[3]
  - A dictionary can be accessed by key: d["cat"]
- The key in a dictionary must be immutable
  - Essentially because key converted to number and number used as index (to find value)
- Finding the value associated with a key is very fast
  - Essentially doesn't depend on # keys!

Python syntax for dictionaries

- Create a dictionary:
  - `d = {}`
  - `d = {"apple":3, "guava":37}`
  - `d = dict([("owen":62.5)("bob":73.9)]`
- Internal dictionaries in Python
  - Sometimes useful in meta-programming
  - `globals():`
  - `locals():`