Plan for the week

- 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 (perhaps?), Wednesday
- What is Computer Science? Why study it?
 - > The future belongs to those who can process information?

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13.1

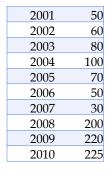
2002

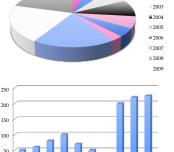
Jotto: The Program Architecture

- 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

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Model View Controller (MVC)





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13.3

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

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danah boyd

Dr. danah boyd is a Senior Researcher at Microsoft Research, ... a Visiting Researcher at Harvard Law School, ... Her work examines everyday practices involving social media, with specific attention to youth engagement, privacy, and risky behaviors. She recently co-authored Hanging Out, Messing Around, and Geeking Out: Kids Living and Learning with New Media.



"From day one, Mark Zuckerberg wanted Facebook to become a social utility. He succeeded. Facebook is now a utility for many. The problem with utilities is that they get regulated."

http://bit.ly/ySwjyl

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13.5

How does this work?

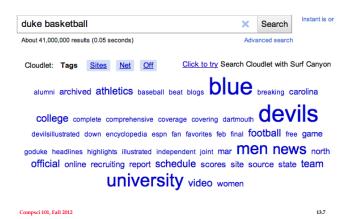
- http://bit.ly/glFvFi
 - ▶ URL Shortener, why useful on Twitter?
 - ➤ How are URLs stored, searched for, used?
- Hashing: convert long string to short number
 - glFvFi is a number!
 - Look up and use!



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13.6

Count word occurrences: tag cloud



Literary Fingerprint

- Reasoning with code in DictionaryTimings.py
 - > How do we find out how fast approaches are?
 - ▶ How do we change the format of the output?
 - Can we organize output differently?
- How can we find 'other' fingerprints
 - > Soundhound, AudibleMagic, genome, images
 - > What will be the key, what will be the value?

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13.8

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

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13.9

Python syntax for dictionaries

- Create a dictionary:
 - > d = {}
 - > d = {"apple":3, "guava":37}
 - > d = dict([("owen":62.5)("bob":73.9)]
 - > d["apple"] = 5
- Coding with Dictionaries
 - > d.items(), d.keys(), d.values()
 - > d.get("key"):
 - > d similar to d.keys() in code, e.g., x in d

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13.11

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!

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Alma Whitten

- Google: Engineering Lead for Privacy, Director for Privacy
 - > Across marketing and engineering
 - Why Johnny Can't Encrypt

"It's more and more the case that every individual is going around with a cheap yet powerful data-capture device, and the ability to connect that device to powerful data services. ... We need to



Build powerful information tools that are equally available to everyone, and if we are sufficiently transparent about (those tools and how they use data), then the outside world gets to say, yes, it's worth it, we want those tools."

http://news.cnet.com/8301-30684_3-20021090-265.html
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13.12