Compsci 101
Dictionaries, Jotto
Live Lecture

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Announcements

• APT-5 due tonight! March 21
• Nothing due on Thursday this week, consulting hours shorter, get ahead on Assign 4!

• Assignment 4 Hangman due Tues. March 30
  • ASGN4 Sakai quiz – do early! Tests understanding
• APT-6 is now out, due Thurs. Apr 1

• Assign 5 is out Thursday, it builds on Assgn 4

• Lab 8 Friday, there is no prelab
Exam 2....

- Exam 2 – not back yet, do not discuss with anyone til we hand it back.
PFTD

• Dictionaries cont.
  • Functions

• A little on sorting

• Jotto!
  • How to approach a large project
  • Splitting functionality
  • Putting it all together
Short Code and Long Time

• See module WordFrequencies.py
  • Find # times each word in a list of words occurs
  • We have tuple/pair: word and word-frequency

```python
def slowcount(words):
    pairs = [(w, words.count(w)) for w in set(words)]
    return sorted(pairs)
```

• Think: How many times is `words.count(w)` called?
  • Why is `set(words)` used in list comprehension?
WordFrequencies with Dictionary

• If start with a million words, then…
  • We look at a million words to count # "cats"
  • Then a million words to count # "dogs"
  • Could update with parallel lists, but still slow!
• Look at each word once: dictionary!

• Key idea: use word as the "key" to find occurrences, update as needed
  • Syntax similar to `counter[k] += 1`
Using fastcount

• Update count if we've seen word before
  • Otherwise it's the first time, occurs once

```python
def fastcount(words):
    d = {}
    for w in words:
        if w in d:
            d[w] += 1
        else:
            d[w] = 1
    return sorted(d.items())
```
WOTO-1 Counting Dictionaries

• In your groups:
  • Come to a consensus
## Dictionary Syntax and Semantics

<table>
<thead>
<tr>
<th>Syntax/Function</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>d = {}</code></td>
<td>Initialize empty dictionary d</td>
</tr>
<tr>
<td><code>d.keys()</code></td>
<td>Collection of keys in dictionary</td>
</tr>
<tr>
<td><code>d.values()</code></td>
<td>Collection of values</td>
</tr>
<tr>
<td><code>d[key]</code></td>
<td>Value associated with key (error if key not in d)</td>
</tr>
<tr>
<td><code>d.get(key,dv)</code></td>
<td>Value associated with key (dv if key not in d, dv is optional)</td>
</tr>
<tr>
<td><code>d.items()</code></td>
<td>Collection of (key,value) tuples in d</td>
</tr>
</tbody>
</table>
WOTO-2 Dictionary Functions

• In your groups:
  • Come to a consensus
How to approach Hangman: Jotto

- [http://jotto.augiehill.com/single.jsp](http://jotto.augiehill.com/single.jsp)
- No letters repeat – have to agree on this
- Shall we play a game?
Write program where Computer Guesses Your Word

• Brute force, no thinking or eliminating letters
  • Pick a word at random, guess it
  • If x letters in common? Only keep words with x letters in common
  • Repeat until guessed
In your groups:
  • Come to a consensus

What is needed?
What order should the code do things?
WOTO-4 More on Jotto

• In your groups:
  • Come to a consensus

• What is needed?
• What order should the code do things?