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>d = {}</td>
<td>Initialize empty dictionary d</td>
</tr>
<tr>
<td>d.keys()</td>
<td>Collection of keys in dictionary</td>
</tr>
<tr>
<td>d.values()</td>
<td>Collection of values</td>
</tr>
<tr>
<td>d[key]</td>
<td>Value associated with key (error if key not in d)</td>
</tr>
<tr>
<td>d.get(key, dv)</td>
<td>Value associated with key (dv if key not in d, dv is optional)</td>
</tr>
<tr>
<td>d.items()</td>
<td>Collection of (key,value) tuples in d</td>
</tr>
</tbody>
</table>

WOTO-2 Dictionary Functions

- In your group:
  - Come to a consensus

How to approach Hangman: Jotto

- 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
WOTO-3 Approaching Implementation

- 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?