

CSC108H Lecture 19

Dan Zingaro

October 26, 2012

ConcepTest

Which of the following **is** a difference between lists and dictionaries?

- ▶ A. List elements cannot be mutable, but dictionary values can be mutable
- ▶ B. Assigning to an index that does not exist in a list is an error, but assigning a value to a key that does not exist in a dictionary is not
- ▶ C. A list can contain a dictionary as one of its elements, but a dictionary cannot contain a list as one of its values
- ▶ D. There is a `dict` constructor that creates a dictionary from a suitable object, but there is no `list` constructor that similarly creates lists

Keys, Values, and Items

- ▶ The `keys` method retrieves a dictionary's keys
- ▶ The `values` method retrieves a dictionary's values
- ▶ The `items` method retrieves a dictionary's (key, value) pairs
- ▶ All of these return views that act much like lists, but they are not lists (e.g. they do not have methods)
- ▶ To explicitly obtain a list, use e.g. `list(d.keys())`

Inverting a Dictionary

Recall this dictionary that maps from types to frequencies.

```
bird_dict = {  
    'peregrine falcon':1, 'harrier falcon':5,  
    'red-tailed hawk':2, 'osprey':11}
```

Sometimes, the **inverted dictionary** is more useful; e.g. for printing names in order of frequency.

```
bird_dict = {  
    1:'peregrine falcon', 5:'harrier falcon',  
    2:'red-tailed hawk', 11:'osprey'}
```

Inverting a Dictionary...

- ▶ If a dictionary maps k to v , the inverted dictionary maps v to k
- ▶ But, consider the dictionary $\{1:3, 2:3\}$
- ▶ We can't invert this as $\{3:1, 3:2\}$
- ▶ The complication here is that multiple keys in the original dictionary can map to the same value
- ▶ Solution: map keys to lists of values to remedy possible collisions
- ▶ Inverting $\{1:3, 2:3\}$ will give $\{3: [1,2]\}$

ConceptTest

$\{1:4, 2:5, 4:5\}$

What is the best inversion of this dictionary?

- ▶ A. $\{4:1, 5:[2,4]\}$
- ▶ B. $\{4:[1], 5:[4,2]\}$
- ▶ C. $\{4:[1], 5:[2,4]\}$
- ▶ D. Two of the above are equally good
- ▶ E. All of the above are equally good

ConcepTest

Here is a birthday month dictionary. Which month has the most coverage?

```
{"December" : {24 : ["Dan", "Joe", "Steph"]},  
  "July" : {17 : ["Angelo"], 16 : ["Chris"]  
           1 : ["Canada"]}}
```

- ▶ A. December
- ▶ B. July
- ▶ C. Both July and December are equally covered

ConceptTest

Here is a birthday month dictionary. Which month has the most coverage?

```
{"December" : {24 : ["Dan", "Joe"], 23 : ["Steph"]},  
  "July" : {17 : ["Angelo"], 16 : ["Chris"]}}
```

- ▶ A. December
- ▶ B. July
- ▶ C. Both July and December are equally covered