CSE 160 Section 6

Nested Dictionaries

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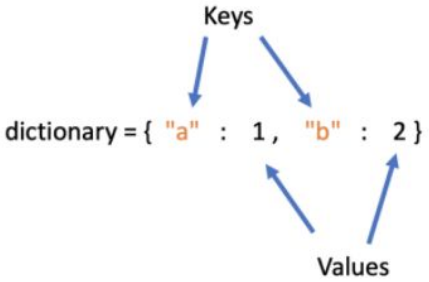
Logistics

- HW4 Part 1 due (Monday, 07 Nov @ 11:59 pm)
  - Draw your data structures (lists, dictionaries) on paper
    - What does your data structure look like before and after a function call?
    - What does it look like before and after the first time through a loop? The second time?
  - Pseudocode
    - Writing down the steps you need to accomplish in plain language BEFORE you write code
    - Write this out on paper, or in a code comment that you erase later
    - Helps you organize your thoughts
  - Gradescope
    - Wait for autograder! Shows errors.

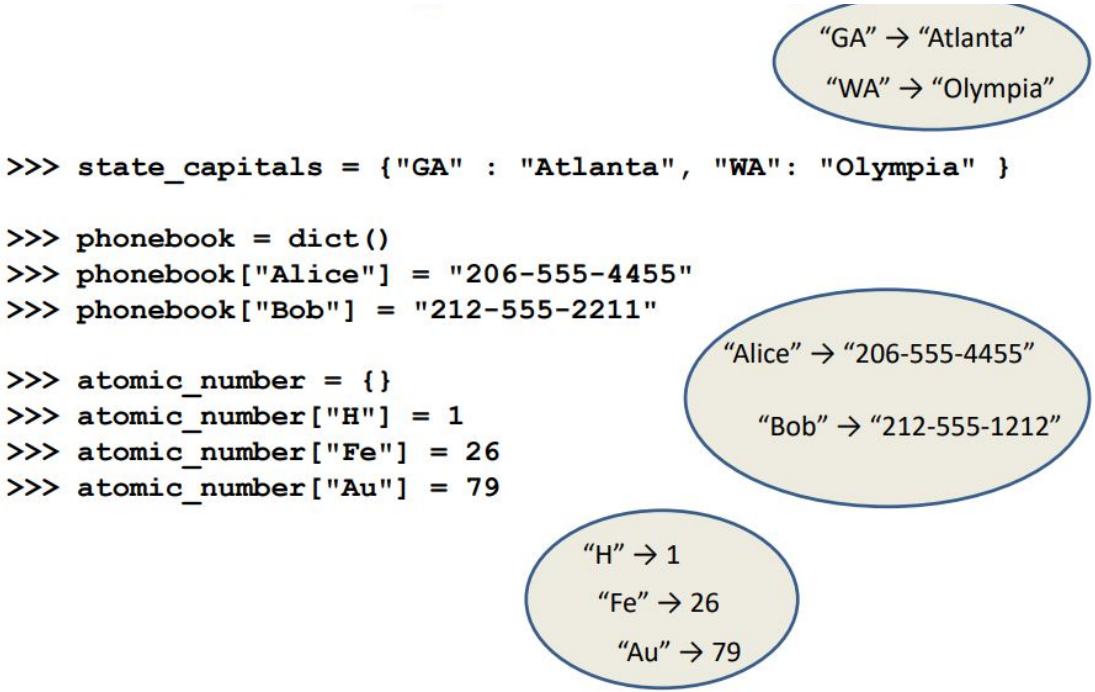
- Congratulations on finishing the midterms! 🎉

Dictionary Review

- Collection of key-value pairs
  - Key type must be immutable and keys must be unique
  - Key-value pair order doesn't matter (dictionaries are unordered)
  - Access value from a key using index syntax (square brackets)
  - If you try to access a key not that doesn't exist in the dictionary, it will throw an error



Dictionary Review Cont'd



Iterating through a dictionary

```
atomic_number = {"H":1, "Fe":26, "Au":79}

# Print out all the keys:
for element_name in atomic_number.keys():
    print(element_name)

# Another way to print out all the keys:
for element_name in atomic_number:
    print(element_name)

# Print out all the values:
for element_number in atomic_number.values():
    print(element_number)

# Print out the keys and the values
for (element_name, element_number) in atomic_number.items():
    print("name:", element_name, "number:", element_number)
```

Dictionary of Lists

- This is important for HW4!
- You can't use lists as keys for a dictionary, but you can use them as values
- From HW4:

```
centroids_dict = {"centroid1": [1, 1, 1, 1], "centroid2":
[2, 2, 2, 2]}
```

- How can we access the first element in the list associated with centroid2?
  - `centroids_dict["centroid2"][0]`
- How can we access the list associated with centroid1?
  - `centroids_dict["centroid1"]`

List of Dictionaries

- Lists can contain pretty much anything, and that includes dictionaries!
- Random example:

```
my_list = [ {“dog” : “bark”,  “cat” : “meow”} ,
        {“dog” : “woof”, “cat” : “purr”} ]
```

- How do we get the first dictionary in the list?
  - `my_list[0]`
- How do we get the value for dog in the second dictionary?
  - `my_list[1][“dog”]`

Dictionary of Dictionaries

- Dictionary values can be dictionaries too!
- Random example:

```
my_dict = { "USA" : {"capital" : "D.C.", "population" : 329500000 },
            "France" : {"capital" : "Paris", "population" : 67390000 }}
```

- How do we get the dictionary with key "USA"?
  - `my_dict["USA"]`
- How do we get the capital of France?
  - `my_dict["France"]["capital"]`

Section Handout Problems

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Problem 1

Write a function `reverse_dict(to_reverse)` that returns a NEW dictionary that is the reverse of the dictionary (reversed key and value) to_reverse . Assume `to_reverse` will have unique keys and values.

For example, if `to_reverse` is: `{'a': 1, 'b': 2, 'c': 3}`

Then this function should return `{1: 'a', 2: 'b', 3: 'c'}`

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Problem 2

Write a function `freq` that takes a string as an argument, and returns a dictionary that maps
each character to its frequency in the given string.

For example, `freq("Star Wars")` should return:
`{"S":1, "t":1, "a":2, "r":2, " ":1, "W":1, "s":1}`.

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Problem 3 Part a

Write code that, given a list of dictionaries, creates a single dictionary containing the sums of values with the same key in the given dictionaries.

For example: Given this list of dictionaries:

```
[{'b': 10, 'a': 5, 'c': 90},
{'b': 78, 'a': 45},
{'a': 90, 'c': 10}]
```

Your code should create : `{'b': 88, 'a': 140, 'c': 100}`

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Problem 3 Part b

Write code that, given a list of dictionaries, creates a single dictionary containing `a list` of values with the same key in the given dictionaries.

For example: Given this list of dictionaries:

```
[{'b': 10, 'a': 5, 'c': 90},
{'b': 78, 'a': 45},
{'a': 90, 'c': 10}]
```

Your code should create : `{'b': [10, 78], 'a': [5, 45, 90], 'c': [90, 10]}`

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Problem 4

Write a function `get_youngest_person` that takes a list of dictionaries as an argument and returns the name of the youngest person in the list. The list of dictionaries will have the following format:

```
people = [ {"name": "Alice", "age": 20},
{"name": "Bob", "age": 9},
{"name": "Dan", "age": 56}]
```

For example, `get_youngest_person(people)` should return `"Bob"`. If there is more than one person with the smallest age, return the name of the person who occurs first in the list. You may assume the list contains at least one person and that no one is less than 1 year old.

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