

Adv. Dictionaries

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Reminders

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- Checkpoint 1 was due last night. Please be sure to push your changes.
- Quiz 3 is Thursday
- Homework is to attempt the practice quiz (50 pts)
- Today: Dictionaries and Checkpoint 2 of the game of life.

Dictionaries

In Review

- Consists of key:value pairs.
- Why do we care? Tracking relationships between things.

```
name_map = {  
    "dhsmith2" : {  
        "first" : "David",  
        "second" : "Smith"  
    },  
    "mflwr" : {  
        "first" : "Max",  
        "second" : "Fowler"  
    }  
}
```

```
def informal_email(names_dict, netid):  
    email = "Dear {0}, I wanted you to know ..."  
    return email.format(names_dict[netid]['first'])  
  
email_text = informal_email(name_map, "dhsmith2")  
asdf
```

Computing a Histogram

Poll Question: Dictionaries

What is the value of `x` after the following function is called?

```
def get_item_counts(some_list):  
    counts = {}  
    for item in some_list:  
        counts[item] += 1  
    return counts
```

```
x = get_item_counts(["This", "This", "This", "Is", "A"])
```

- ① {"This": 3, "Is": 1, "A": 1}
- ② {This: 3, Is: 1, A: 1}
- ③ {"This": "3", "Is": "1", "A": "1"}
- ④ KeyError

Poll Question: Dictionaries

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```

- ❶ {"This": 3, "Is": 1, "A": 1}
- ❷ {This: 3, Is: 1, A: 1}
- ❸ {"This": "3", "Is": "1", "A": "1"}
- ❹ KeyError

Why, and how do we fix this?

Dictionaries: Computing a Histogram

Creating a count map of items in a collection is a common dictionary pattern:

```
def get_item_counts(some_list):  
    counts = {}  
    for item in some_list:  
        if item not in counts:  
            counts[item] = 1  
        else:  
            counts[item] += 1  
    return counts
```

Key, Item, Value Functions

Poll Question: Dictionary Functions

What will be printed to the screen after the following has run?

```
dict_1 = {"foo": 5, "bar": 10, "baz": 12}
for i in keys(dict_1):
    print(i, end=" ")
```

- ☐ A foo bar baz
- ☐ B 5 10 12
- ☐ C NameError
- ☐ D SyntaxError

Poll Question: Dictionary Functions

What will be printed to the screen after the following has run?

```
dict_1 = {"foo": 5, "bar": 10, "baz": 12}
for i in dict_1.keys():
    print(i, end=" ")
```

- ☐ A foo bar baz
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- ☐ A foo bar baz
- ☐ B 5 10 12
- ☐ C NameError
- ☐ D SyntaxError

Poll Question: Dictionary Functions

What will be printed to the screen after the following has run?

```
dict_1 = {"foo": 5, "bar": 3, "baz": 10}
for i in dict_1.items():
    print(i, end=" ")
```

- Ⓐ ('foo', 5) ('bar', 3) ('baz', 10)
- Ⓑ (5, 'foo') (3, 'bar') (10, 'baz')
- Ⓒ NameError
- Ⓓ Something else...?

Poll Question: Dictionary Functions

What will be printed to the screen after the following has run?

```
dict_1 = {"foo": 5, "bar": 10, "baz": 12}
all_keys = []
total_val = 0
for foo, bar in dict_1.items():
    all_keys.append(foo)
    total_val += bar
print(all_keys, total_val)
```

- ☐ A [5, 10, 12] "foobarbaz"
- ☐ B ["foo", "bar", "baz"] 27
- ☐ C TypeError
- ☐ D Something else...?

Poll Question: Dictionary Functions

What will be printed to the screen after the following has run?

```
dict_1 = {"foo": 5, "bar": 10, "baz": 12}
for i in dict_1.values():
    print(i, end=" ")
```

- ☐ A foo bar baz
- ☐ B 5 5 5
- ☐ C 5 10 12
- ☐ D Error

Dictionary Functions

Functions for iteration:

- 1 `dict.items()` → Generates tuples of all of the key value pairs in the dictionary.
- 2 `dict.keys()` → Generates all of the keys in the dictionary.
- 3 `dict.values()` → Generates all of the values in the dictionary.

Functions for modification:

- 1 `dict.clear()` → Clears all the key value pairs from the dictionary.
- 2 `dict.get(key, default)` → Tries to lookup the value associated with a key and gives default if key not found.
- 3 `dict1.update(dict2)` → Merges the key:value pairs from dict1 into dict2.
- 4 `dict.pop(key, default)` → Removes the key:value pair, returns the value, default if key not found.