

Dictionaries and Functions

David H Smith IV

University of Illinois Urbana-Champaign

Mon, July 19 2021

Course Overview

Reminders

- Signup for the quiz or submit a conflict request
- Practice quiz is up

Dictionaries

In Review

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

```
name_map = {  
    "dhsmith2" : {  
        "first" : "David",  
        "second" : "Smith"  
    },  
    "zilles" : {  
        "first" : "Craig",  
        "second" : "Zilles"  
    }  
}
```

```
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")
```

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  
  
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

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
```

Functions

Poll Question: Function Parameters

What is the value of `result` after the following code is run?

```
def arithmetic(x = 2, y = 3, z = 4):  
    return x * y * z  
result = arithmetic(1, z=5)
```

- ☐ A 10
- ☐ B 20
- ☐ C 24
- ☐ D 30
- ☐ E Some other value
- ☐ F Error

Function Returns

Functions can (kind of) return multiple values by putting them all in a tuple.

```
def return_first_and_last(a_list):  
    return (a_list[0], a_list[-1])  
x, y = return_first_and_last([1, 2, 3])
```

Poll Question: Function Args and Mutability

What is the value of `x[0]` after this code executes:

```
def remove_first(a_list):  
    a_list = a_list[1:]  
  
x = [1, 2, 3, 4]  
remove_first(x)
```

- ☐ A 1
- ☐ B 2
- ☐ C 3
- ☐ D 4
- ☐ E Something else
- ☐ F An error occurs

Poll Question: Functions

What, if anything, gets printed to the screen after this code executes?

```
def add1(x): return x + 1
def mul2(x): return x * 2

x = 1
fns = [add1, mul2, mul2, print]
for f in fns:
    x = f(x)
```

- ☐ A Nothing
- ☐ B 1
- ☐ C 4
- ☐ D 8
- ☐ E Something else
- ☐ F SyntaxError

Poll Question: Scope

What are the values of `w`, `x`, `y` and `z` after this code executes?

```
x, y, z = (7, 5, 10)
```

```
def a_function(y):  
    x = 2 * y  
    return x * z
```

```
w = a_function(x)
```

- ☐ A 50, 7, 5, 10
- ☐ B 100, 10, 5, 10
- ☐ C 140, 7, 5, 10
- ☐ D 140, 14, 5, 10
- ☐ E SyntaxError