Using dictionaries

DATA TYPES FOR DATA SCIENCE IN PYTHON

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Instructor

Creating and looping through dictionaries

- Hold data in key/value pairs
- Nestable (use a dictionary as the value of a key within a dictionary)
- Iterable
- Created by dict() or {}

```
art_galleries = {}

for name, zip_code in galleries:
    art_galleries[name] = zip_code
```

Printing in the loop

```python
for name in art_galleries:
    print(name)
```

```
Zwirner David Gallery
Zwirner & Wirth
Zito Studio Gallery
Zetterquist Galleries
Zarre Andre Gallery
```

Safely finding by key

```
art_galleries['Louvre']
```

```
|---------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
<ipython-input-1-4f51c265f287> in <module>()
--> 1 art_galleries['Louvre']

KeyError: 'Louvre'
```

- Getting a value from a dictionary is done using the key as an index
- If you ask for a key that does not exist that will stop your program from running in a KeyError

Safely finding by key (cont.)

- `.get()` method allows you to safely access a key without error or exception handling
- If a key is not in the dictionary, `.get()` returns `None` by default or you can supply a value to return

```
art_galleries.get('Louvre', 'Not Found')
```

```
'Not Found'
```

```
art_galleries.get('Zarre Andre Gallery')
```

```
'10011'
```

Working with nested dictionaries

```
art_galleries.keys()
```

```
dict_keys(['10021', '10013', '10001', '10009', '10011',
   ...: '10022', '10027', '10019', '11106', '10128'])
```

```
print(art_galleries['10027'])
```

```
{"Paige's Art Gallery": '(212) 531-1577',
'Triple Candie': '(212) 865-0783',
'Africart Motherland Inc': '(212) 368-6802',
'Inner City Art Gallery Inc': '(212) 368-4941'}
```

- The `.keys()` method shows the keys for a given dictionary

Accessing nested data

```
art_galleries['10027']['Inner City Art Gallery Inc']
```

```
'(212) 368-4941'
```

- Common way to deal with repeating data structures
- Can be accessed using multiple indices or the `.get()` method

Let's practice!

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Altering dictionaries

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Adding and extending dictionaries

- Assignment to add a new key/value to a dictionary
- `.update()` method to update a dictionary from another dictionary, tuples or keywords

```python
print(galleries_10007)
```

```
{'Nyabinghi African Gift Shop': '(212) 566-3336'}
```

```python
art_galleries['10007'] = galleries_10007
```

Updating a dictionary

```python
galleries_11234 = [
  ('A J ARTS LTD', '(718) 763-5473'),
  ('Doug Meyer Fine Art', '(718) 375-8006'),
  ('Portrait Gallery', '(718) 377-8762')]
art_galleries['11234'].update(galleries_11234)
print(art_galleries['11234'])
```

```
{'Portrait Gallery': '(718) 377-8762',
'A J ARTS LTD': '(718) 763-5473',
'Doug Meyer Fine Art': '(718) 375-8006'}
```

Popping and deleting from dictionaries

- `del` instruction deletes a key/value
- `.pop()` method safely removes a key/value from a dictionary.

```python
del art_galleries['11234']
galleries_10310 = art_galleries.pop('10310')
print(galleries_10310)
```

```
{'New Dorp Village Antiques Ltd': '(718) 815-2526'}
```

Let's practice!

Pythonically using dictionaries

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Working with dictionaries more pythonically

- `.items()` method returns an object we can iterate over

```
for gallery, phone_num in art_galleries.items():
    print(gallery)
    print(phone_num)
```

```
'Miakey Art Gallery'
'(718) 686-0788'
'Morning Star Gallery Ltd'
'(212) 334-9330'}
'New York Art Expo Inc'
'(212) 363-8280'
```

Checking dictionaries for data

- `.get()` does a lot of work to check for a key
- `in` operator is much more efficient and clearer

```
'11234' in art_galleries
```

```
False
```

```
if '10010' in art_galleries:
    print('I found: %s' % art_galleries['10010'])
else:
    print('No galleries found.')
```

```
I found: {'Nyabinghi Africian Gift Shop': '(212) 566-3336'}
```

Let's practice!

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Working with CSV files

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CSV Files

```
NAME,TEL,ADDRESS1,ADDRESS2,CITY,ZIP
O'reilly William & Co Ltd,(212) 396-1822,52 E 76th St,,New York,10021
```

Reading from a file using CSV reader

- Python `csv` module
- `open()` function provides a variable that represents a file, takes a path and a mode
- `csv.reader()` reads a file object and returns the lines from the file as tuples
- `.close()` method closes file objects

```python
import csv
csvfile = open('ART_GALLERY.csv', 'r')
for row in csv.reader(csvfile):
    print(row)
```

Reading from a CSV - Results

```
['NAME', 'the_geom', 'TEL', 'URL', 'ADDRESS1',
'ADDRESS2', 'CITY', 'ZIP']
["O'reilly William & Co Ltd",
'POINT (-73.96273074561996 40.773800871637576)',
'(212) 396-1822', '52 E 76th St', '', 'New York',
'10021']
```

```
csvfile.close()
```

Creating a dictionary from a file

- Often we want to go from CSV file to dictionary
- DictReader does just that
- If data doesn't have a header row, you can pass in the column names

```python
for row in csv.DictReader(csvfile):
    print(row)
```

```
OrderedDict([('NAME', 'Odyssia Gallery'),
('the_geom', 'POINT (-73.96269813635554 40.7618747512849)'),
('TEL', '(212) 486-7338'),
('URL', 'http://www.livevillage.com/newyork/art/odyssia-gallery.html'),
('ADDRESS1', '305 E 61st St'), ...
```

Let's practice!

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