Python/Web Data Course

Structured Data

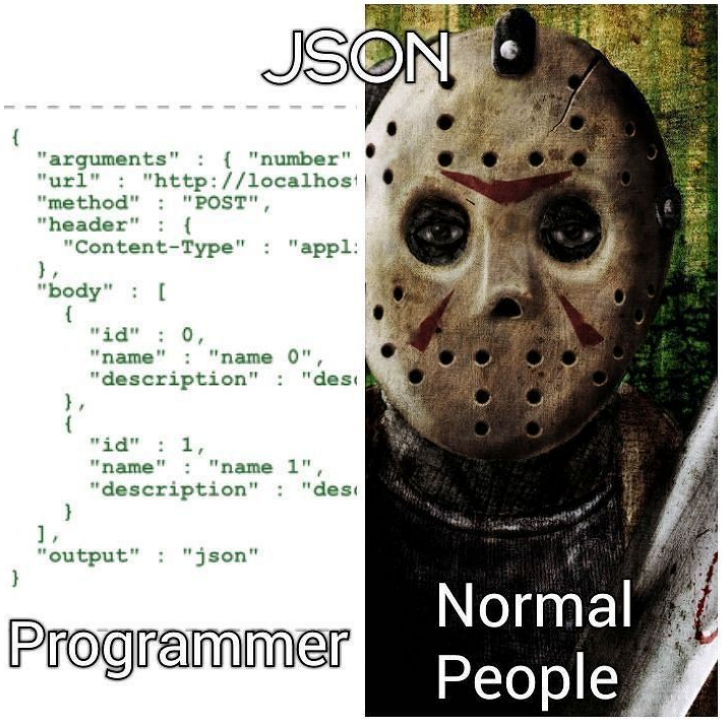
Let’s watch a short video on JSON

https://www.youtube.com/watch?v=7mj-p1Os6QA

Review JSON

1. JavaScript Object Notation
2. Originally to transmit data on www, now **language independent**
3. Structure is **easy to read** for humans and computers
4. **Compact** to send through Internet

What is JSON?

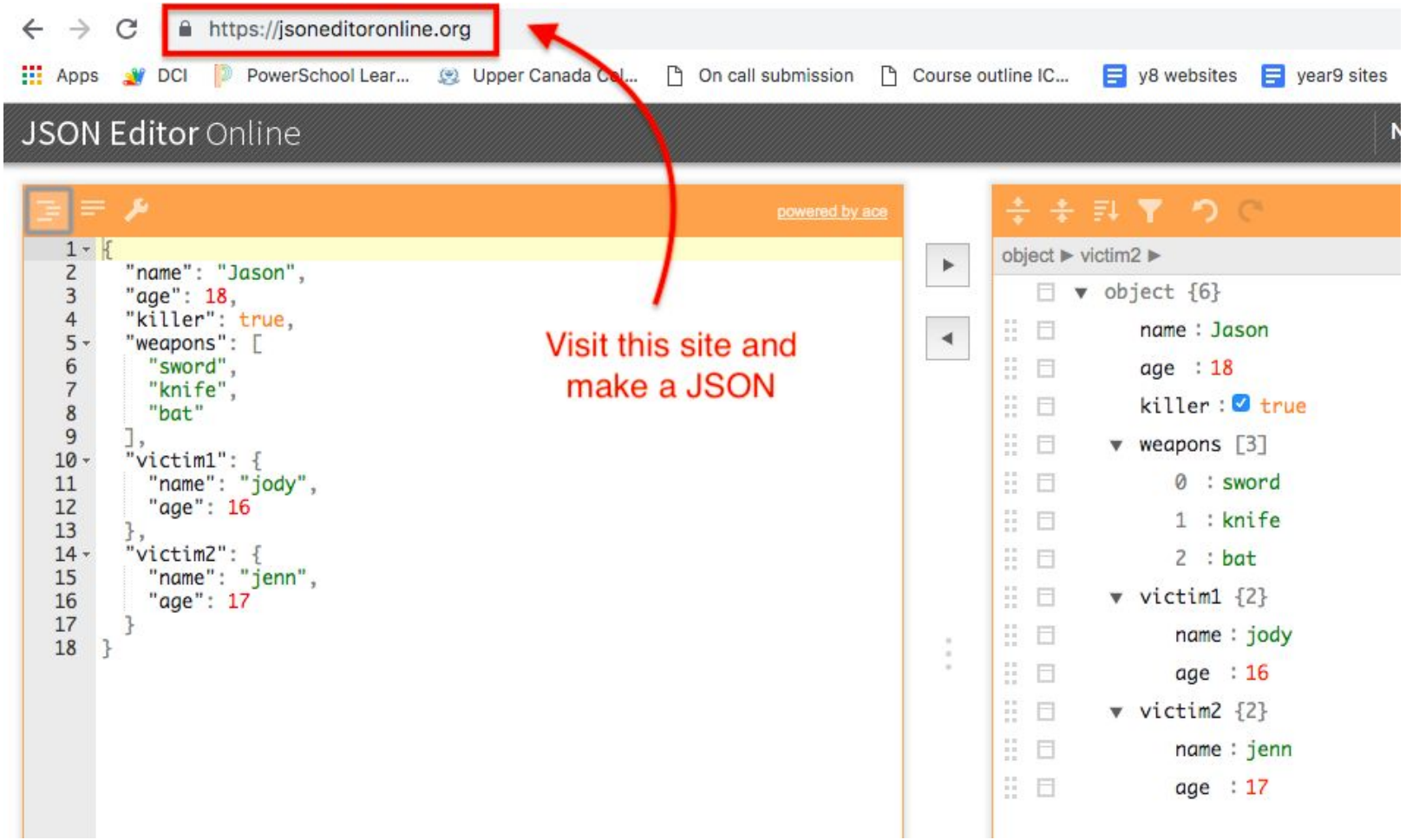



```
{
   name:”Jason”,
   age: 18,
   killer: true,
   “weapons”: [“sword”,”knife”,”b  ],
   “victim1”: {“name”:”jody”, age:
16},
   “victim2”: {“name”:”jenn”, age:
17},

}
```

00 01 02 04

Data types in JSON



https://jsoneditoronline.org/

Review Questions

1. What does the acronym JSON stand for?
2. What is JSON?
3. What is the main purpose of JSON?
4. What languages can JSON be used with?
5. What tool can be used to ensure JSON validity?
6. Which data types can be inside a JSON structure?

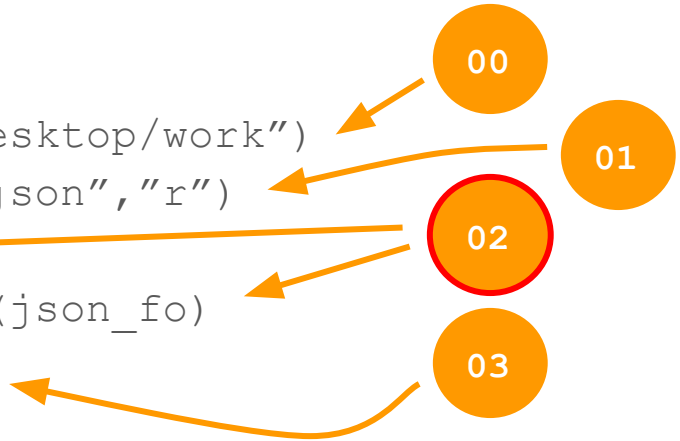
Ex. 1 - Download student data (data.json)

1. Navigate to https://mdjhoel.github.io/datacourse/
2. Right click and download data.json to your new “work” folder

Ex. 1 - Read in text file and load as a JSON object

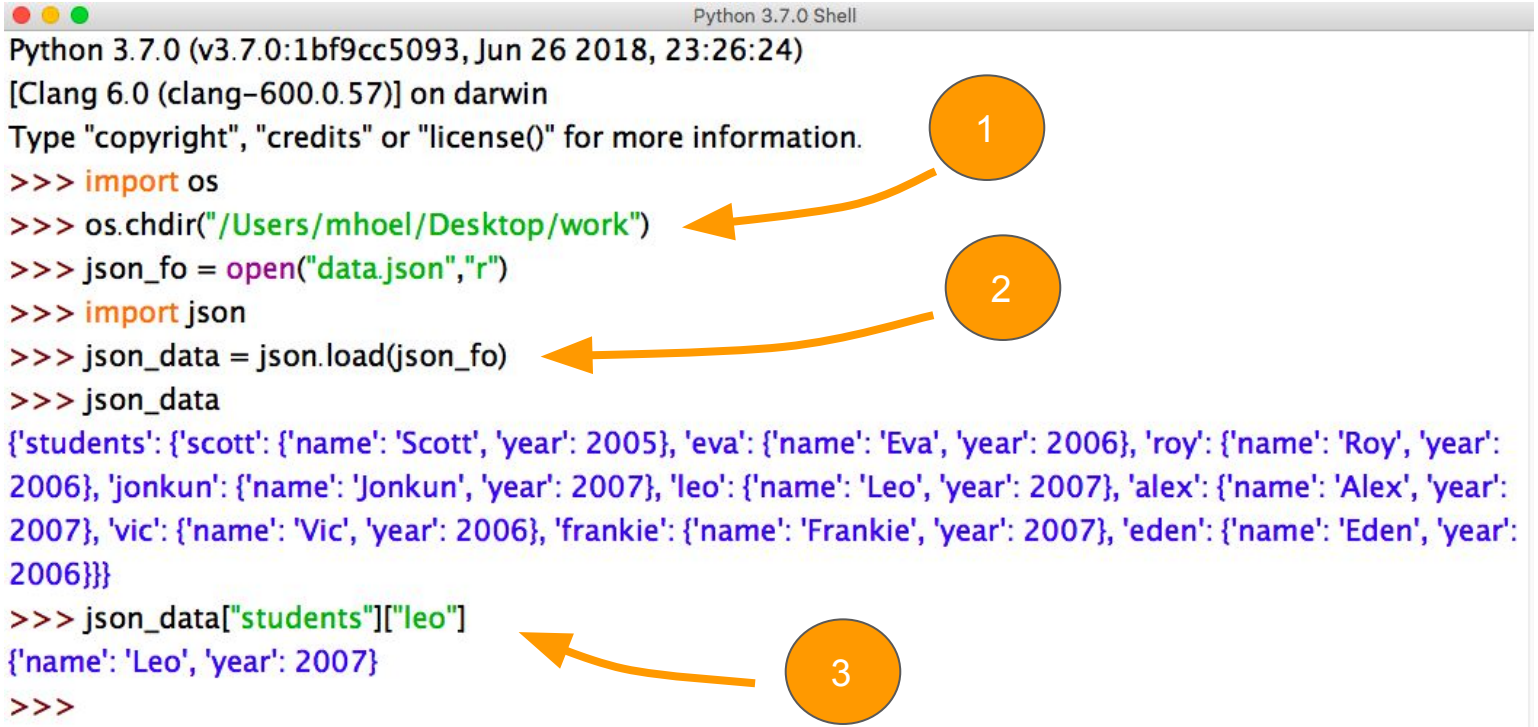
1. Type the following commands into the Python interpreter shell

```
>>> import os
>>> chdir("/Users/mhoel/Desktop/work")
>>> json_fo = open("data.json","r")
>>> import json
>>> json_data = json.load(json_fo)
>>> json_data["students"]
>>> json_fo.close( )
```

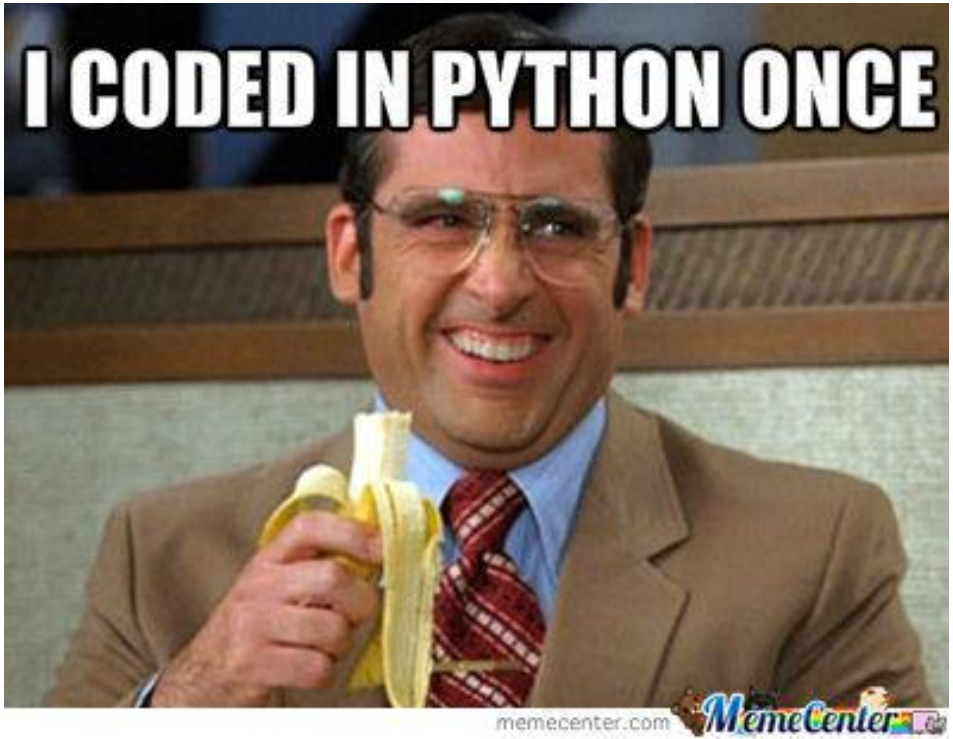


3. What do you think will happen at each stage?

Ex 1. Results and Questions



Good Job! Now it time for a harder one!



Ex. 2 - Problem

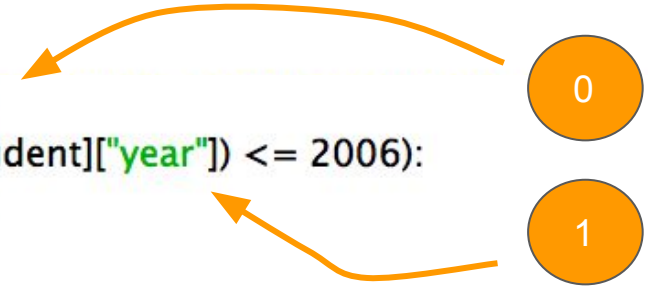
Write a program that will **input** data.json, **process** the data to find students who were born in years equal or less than 2006 and **output** only these names to the screen.

HINT:

You need to use an ***if statement*** and maybe use int( ) to convert string data to numbers to do the math

Ex. 2 Results and Questions

```
>>> import os
>>> os.chdir("/Users/mhoel/Desktop/work")
>>> file_input = open("data.json")
>>> import json
>>> data = json.load(file_input)
>>> data
>>> for student in data["students"]:
        if (int(data["students"][student]["year"]) <= 2006):
            print(student)
```




```
scott
eva
roy
vic
eden
```

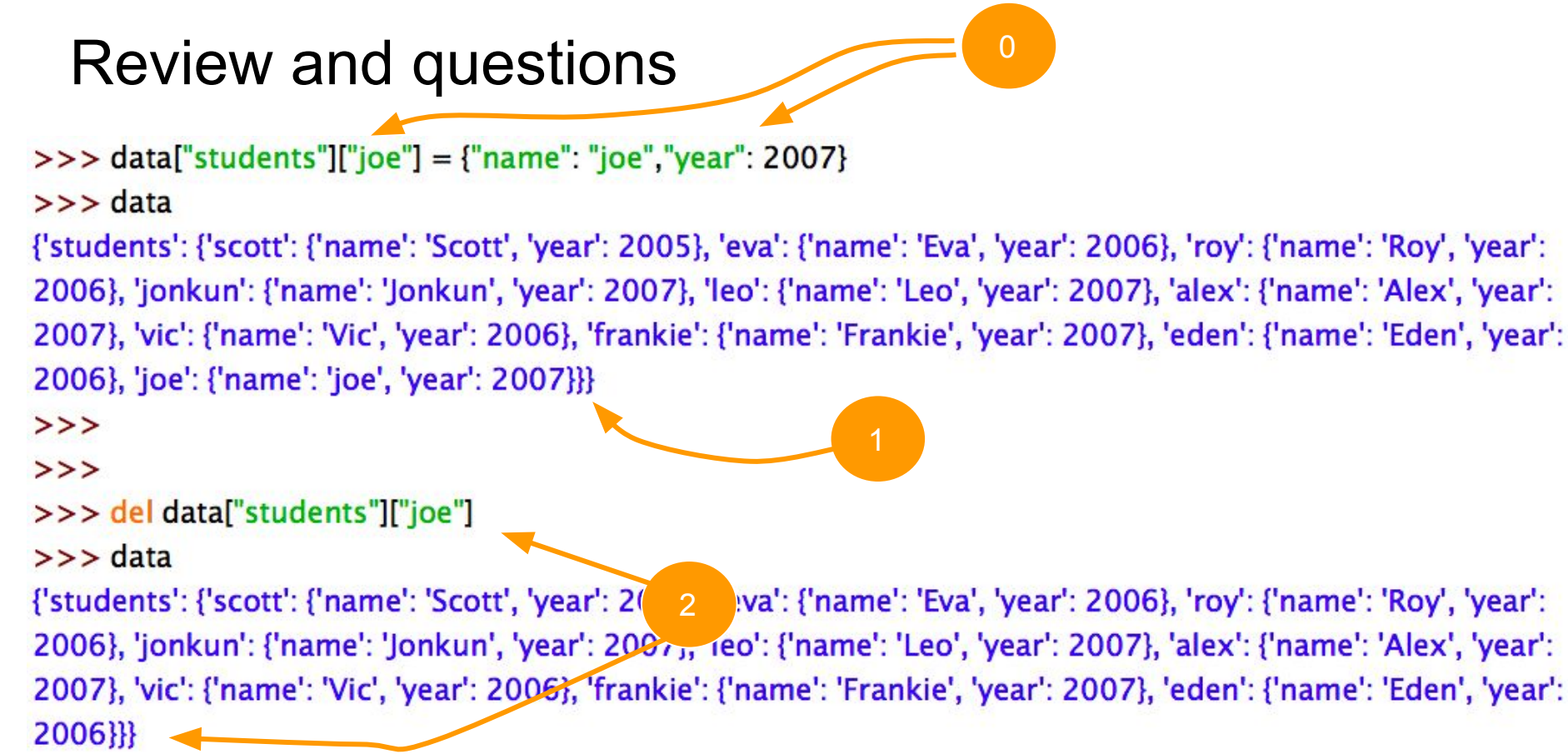
Good Job! Now it time for writing files!

Adding and deleting elements to json in Python

1. To open a file object for reading & **add element** and then **delete it**

```
>>> import os
>>> chdir(“/Users/mhoel/Desktop/work”)
>>> json_fo = open(“data.json”,”r”)
>>> import json
>>> json_data = json.load(json_fo)
>>> json_fo.close( )
>>> json_data
>>> json_data[“students”][“joe”] = {“name”: “joe”, “year”: 2007}
>>> json_data
>>> del json_data[“students”][“joe”]
>>> json_data
```

Review and questions



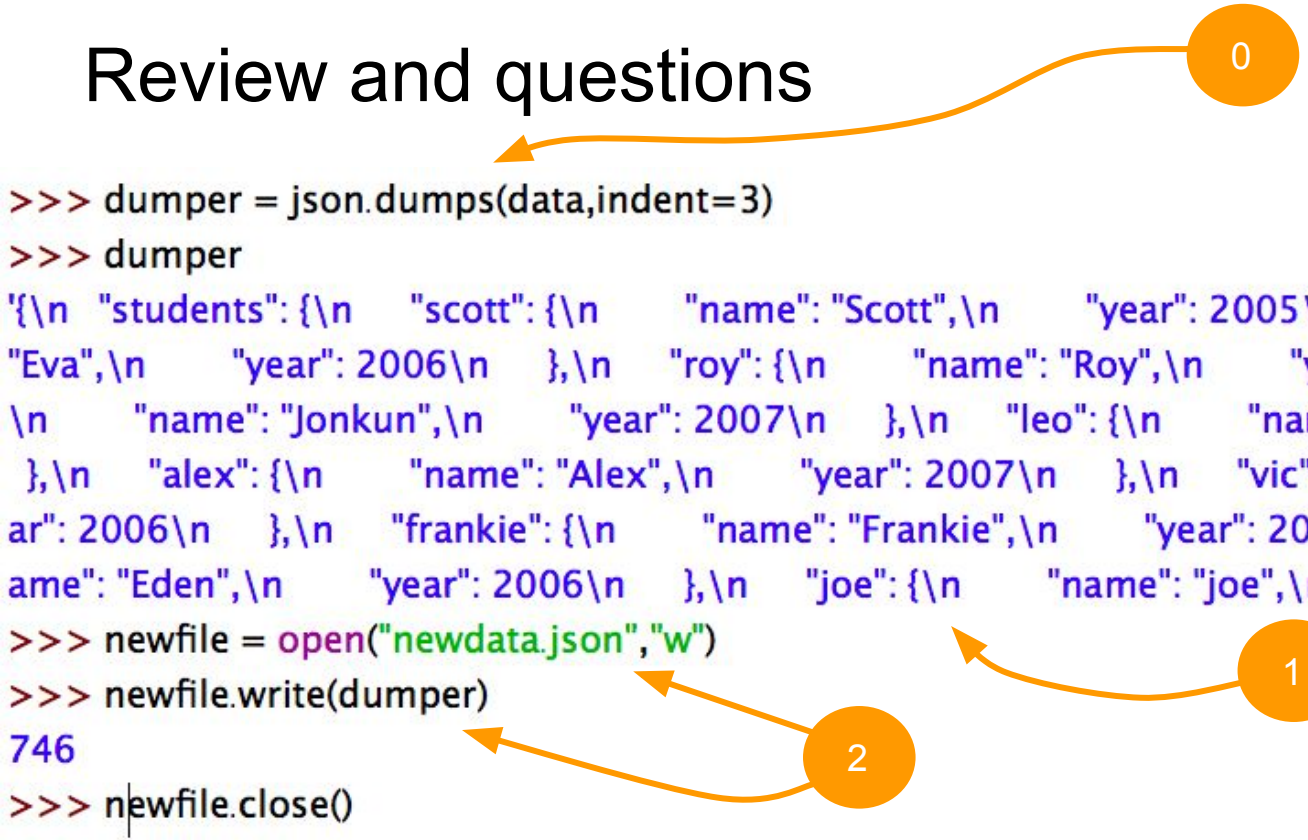

```
>>> data["students"]["joe"] = {"name": "joe","year": 2007}
>>> data
{'students': {'scott': {'name': 'Scott', 'year': 2005}, 'eva': {'name': 'Eva', 'year': 2006}, 'roy': {'name': 'Roy', 'year':
2006}, 'jonkun': {'name': 'Jonkun', 'year': 2007}, 'leo': {'name': 'Leo', 'year': 2007}, 'alex': {'name': 'Alex', 'year':
2007}, 'vic': {'name': 'Vic', 'year': 2006}, 'frankie': {'name': 'Frankie', 'year': 2007}, 'eden': {'name': 'Eden', 'year':
2006}, 'joe': {'name': 'joe', 'year': 2007}}}
>>>
>>>
>>> del data["students"]["joe"]
>>> data
{'students': {'scott': {'name': 'Scott', 'year': 2
va': {'name': 'Eva', 'year': 2006}, 'roy': {'name': 'Roy', 'year':
2006}, 'jonkun': {'name': 'Jonkun', 'year': 200
eo': {'name': 'Leo', 'year': 2007}, 'alex': {'name': 'Alex', 'year':
2007}, 'vic': {'name': 'Vic', 'year': 2006}, 'frankie': {'name': 'Frankie', 'year': 2007}, 'eden': {'name': 'Eden', 'year':
2006}}}
```

“Pretty” write json to a new file with Python

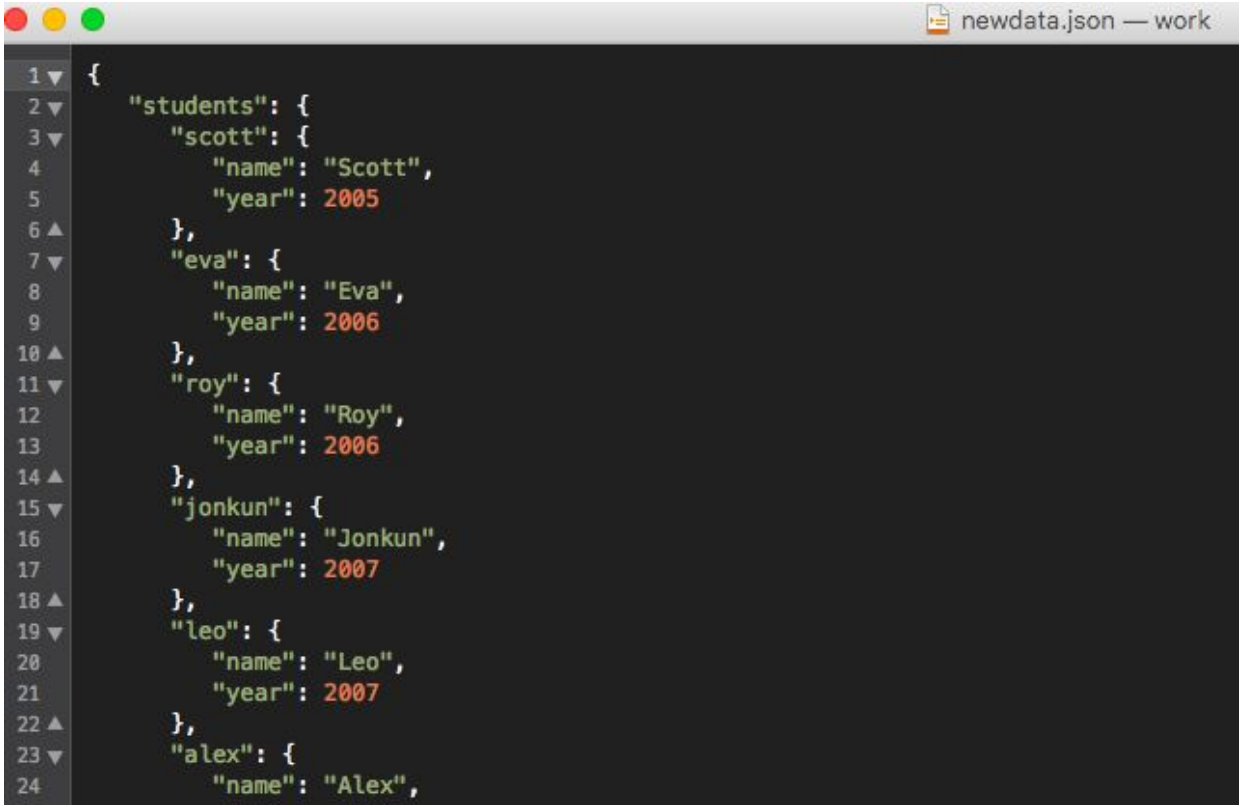
1. Convert a json object to a string and write to a new file with 3 char indent

```
>>> import os
>>> chdir(“/Users/mhoel/Desktop/work”)
>>> json_fo = open(“data.json”,”r”)
>>> import json
>>> data = json.load(json_fo)
>>> json_fo.close( )
>>> data[“students”][“joe”] = {“name”: “joe”, “year”: 2007}
>>> newfile = open(“newdata.json”,”w”)
>>> dumper = json.dumps(data,indent=3)
>>> newfile.write(dumper)
>>> newfile.close( )
```

Review and questions



Notice the pretty indent (3 characters)



Homework

1. Navigate to https://github.com/jdorfman/awesome-json-datasets
2. Review the available json datasets online
3. Right click and download your favourites to your “work” folder
4. Paste the json data into https://jsoneditoronline.org/ and review it
5. Prepare to talk about your favourite json dataset next class

Homework - Pokemon Video Game Example

https://jsoneditoronline.org

Apps DCI PowerSchool Lear... Upper Canada Col... On call submission Course outline IC... y8 websites year9 sites Year10 Schedules MYP Teacher Gu

JSON Editor Online

New Open ▾ Save ▾ Settings ▾ Help

powered by ace


```
{"abilities":[{"ability":{"name":"chlorophyll","url":"https
://pokeapi.co/api/v2/ability/34/"},"is_hidden":true,"slot":3}
,{"ability":{"name":"overgrow","url":"https://pokeapi.co/api/v2
/ability/65/"},"is_hidden":false,"slot":1}],"base_experience":64
,"forms":[{"name":"bulbasaur","url":"https://pokeapi.co/api/v2
/pokemon-form/1/"}],"game_indices":[{"game_index":1,"version"
:{"name":"white-2","url":"https://pokeapi.co/api/v2/version/22/"}}
,{"game_index":1,"version":{"name":"black-2","url":"https
://pokeapi.co/api/v2/version/21/"}},{"game_index":1,"version"
:{"name":"white","url":"https://pokeapi.co/api/v2/version/18/"}}
,{"game_index":1,"version":{"name":"black","url":"https://pokeapi
.co/api/v2/version/17/"}},{"game_index":1,"version":{"name"
:"soulsilver","url":"https://pokeapi.co/api/v2/version/16/"}}
,{"game_index":1,"version":{"name":"heartgold","url":"https
://pokeapi.co/api/v2/version/15/"}},{"game_index":1,"version"
:{"name":"platinum","url":"https://pokeapi.co/api/v2/version/14
/"}},{"game_index":1,"version":{"name":"pearl","url":"https
://pokeapi.co/api/v2/version/13/"}},{"game_index":1,"version"
:{"name":"diamond","url":"https://pokeapi.co/api/v2/version/12/"}}
,{"game_index":1,"version":{"name":"leafgreen","url":"https
://pokeapi.co/api/v2/version/11/"}},{"game_index":1,"version"
:{"name":"firered","url":"https://pokeapi.co/api/v2/version/10/"}}
,{"game_index":1,"version":{"name":"emerald","url":"https
://pokeapi.co/api/v2/version/9/"}},{"game_index":1,"version"
:{"name":"sapphire","url":"https://pokeapi.co/api/v2/version/8/"}}
,{"game_index":1,"version":{"name":"ruby","url":"https://pokeapi
.co/api/v2/version/7/"}},{"game_index":1,"version":{"name"
:"crystal","url":"https://pokeapi.co/api/v2/version/6/"}}
,{"game_index":1,"version":{"name":"silver","url":"https://pokeapi
.co/api/v2/version/5/"}},{"game_index":1,"version":{"name":"gold"
,"url":"https://pokeapi.co/api/v2/version/4/"}},{"game_index":153
,"version":{"name":"yellow","url":"https://pokeapi.co/api/v2
```


object ▶ abilities ▶

- ▼ object {17}
  - name : bulbasaur
  - ▶ abilities [2]
  - base_experience : 64
  - ▶ forms [1]
  - ▶ game_indices [20]
  - height : 7
  - ▶ held_items [0]
  - id : 1
  - is_default : ☑ true
  - location_area_encounters : https://pokeapi.co/api/v2/pokemon/1/encounters
  - ▶ moves [78]
  - order : 1
  - ▶ species {2}
  - ▶ sprites {8}
  - ▶ stats [6]
  - ▶ types [2]
  - weight : 69