

SI206 Discussion 10

API & JSON

Objective

- The purpose of today's section is to get familiar with API and JSON.
 - Create an API request
 - Get familiar with JSON viewer
 - Understand the difference between JSON format and python format
 - Analyze nested data
 - Debugging

Understand the difference between JSON format and python format

```
url = "https://api.sunrise-sunset.org/json?lat=36.7201600&lng=-4.4203400&date=today"
data1 = requests.get(url)          # receive response
data2 = data1.text                  # request -> JSON object
data3 = json.loads(data2)           # JSON -> Python object
data4 = json.dumps(data3)           # Python -> JSON object
```

- data2 and data4 are identical
- You need to paste data2 or data4 to JSON Online Editor

JSON Editor Online : <https://jsoneditoronline.org/#left=local.vigeci&right=local.sinece>

- Google "JSON editor online"
- Just copy and paste JSON format strings.

The screenshot displays the JSON Editor Online interface. The top bar includes the title "JSON Editor Online" and navigation buttons: "New", "Open", "Save", "Settings", and "Help". The main area is split into two panels. The left panel, titled "powered by ace", shows a JSON string being edited. The right panel shows the hierarchical tree view of the JSON data.

JSON String (Left Panel):

```
1 [{"response_code":0,"results":[{"category":  
  "Science & Nature","type":"boolean"  
  ,"difficulty":"medium","question"  
  :  
    "Hippopotomonstrosesquippedaliophobia  
    is the irrational fear of long words."  
  ,"correct_answer":"True"  
  ,"incorrect_answers":["False"]}]  
  ,{"category":"Science & Nature","type"  
  :  
    "boolean","difficulty":"hard"  
  ,"question":  
    "Scientists can grow teeth  
    from urine.","correct_answer":"True"  
  ,"incorrect_answers":["False"]}]}]
```

Tree View (Right Panel):

- object ▶ results ▶ 1 ▶
 - object {2}
 - response_code : 0
 - results [2]
 - 0 {6}
 - category : Science & Nature
 - type : boolean
 - difficulty : medium
 - question : Hippopotomonstrosesquippedaliophobia is the irrational fear of long words.
 - correct_answer : True
 - incorrect_answers [1]

Today's Task (more detail in starter code)

Use the World Bank API and get population for different countries

Demo:

Write a function `get_population(country_code, date)` that takes a country code (e.g. USA, BRA) and a date in years (e.g. 2017) that returns the value as an integer.

TASK 1:

Write a function `get_data(country_code, first_year, second_year)` that takes a country code (e.g. USA, BRA) and two consecutive years (e.g. 2004 and 2005) that returns the data from the API after converting it to a python list.

TASK 2:

Write a function `population_growth(country_code, first_year, second_year)` that calls `get_data(country_code, first_year, second_year)` and returns the population growth of the country for the two years in a tuple.

DEMO

Walking through how to solve `get_population()`

How to go about TASK 1?

1. Read documentation for World Bank API

<https://datahelpdesk.worldbank.org/knowledgebase/articles/898581>

2. What is the base URL of the World Bank API?

3. What is the code for population information? (Scroll to "Featured Indicators" on the page below)

<http://datatopics.worldbank.org/world-development-indicators/themes/people.html>

4. How should the parameters about population, country, and year be combined with the base URL?

TASK 1: Create an API request with the request url

Sample code for API request (from lecture material)

```
try:
    # get the data from the url
    params = str(lat) + "&lng=" + str(long) + "&date=today"
    url = "https://api.sunrise-sunset.org/json?lat=" + params
    r = requests.get(url)
    dict = json.loads(r.text)
except:
    print("error when reading from url")
    dict = {}
```