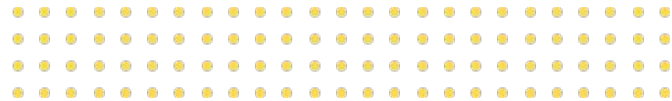# Discussion 10: JSON & APIs

Reminders

- Submit your work to **Canvas Assignment / Discussion 10**

- **Homework 6** due this **Friday, March 28th @11:59PM**

- Remaining late days can only be used for **Project 2**

- Start to form **groups of 2-3** for the Final Project

JSON– JavaScript Object Notation

▶ **Store and exchange data**

    ▶ As a string

▶ **Similar to nested dictionaries and lists in Python**

    ▶ Uses *null* instead of *None*

JSON Example

```
{"employees":[
    { "firstName":"John", "lastName":"Doe" },
    { "firstName":"Anna", "lastName":"Smith" },
    { "firstName":"Peter", "lastName":"Jones" }
]}
```

Reading JSON in Python

▶ Module – json

    ▶ json.loads(string)

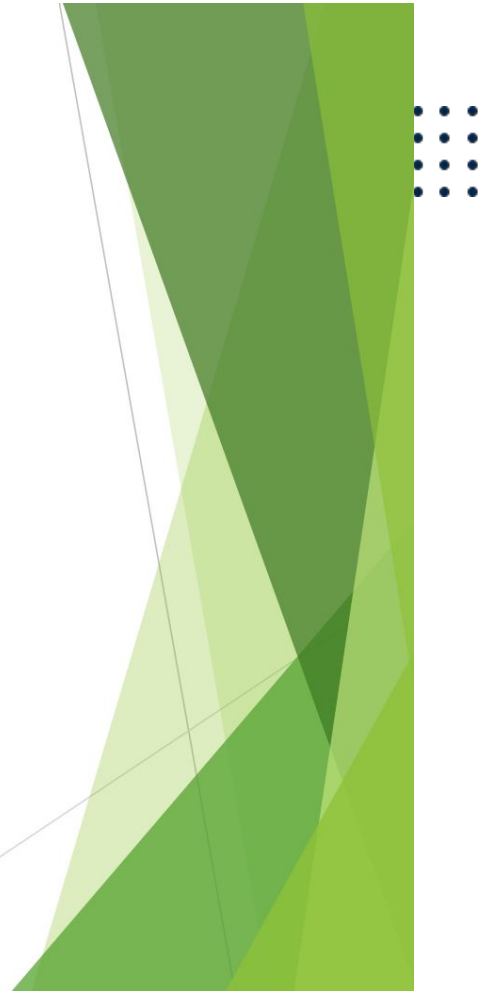   ▶ Takes a JSON string as input and returns a Python object

            ▶ Dictionary or list | JSON -> Python |

    ▶ json.dumps(obj)

        ▶ Takes a Python object as input and returns a JSON string

            | Python -> JSON |

Reading JSON from a File

▶ Import the JSON module

    import json

▶ Get the file object – open the file for reading

    source_dir = os.path.dirname(__file__)

    full_path = os.path.join(source_dir, 'com.json')

    file = open(full_path, 'r')

▶ Read the contents into one big string

    contents = file.read()

▶ Close the file

    file.close()

▶ Convert the string into a Python object (list or dictionary)

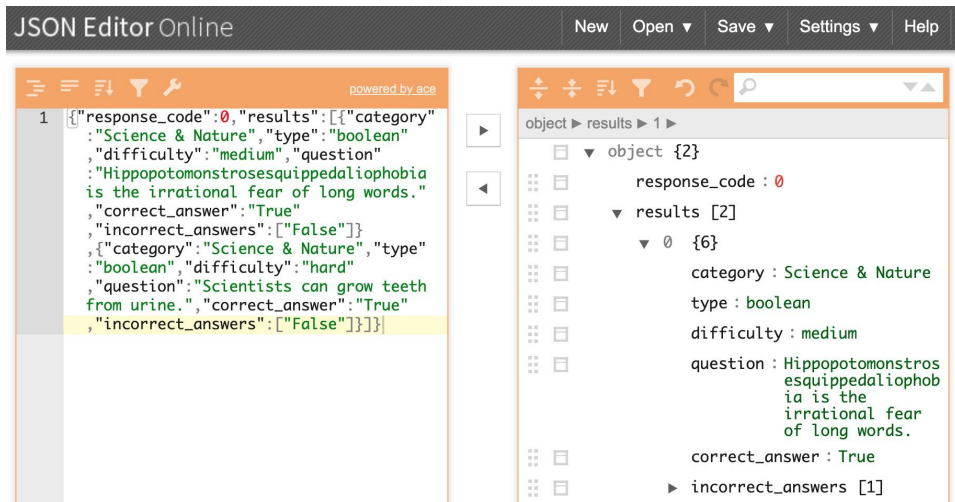   data = json.loads(string)

▶ Process the Python object - data

JSON Editor

JSON Editor Online : https://jsoneditoronline.org

It's super helpful to see the structure in a readable format that you can manipulate.

New document 1

text | tree | table

```
1 {"http://www.omdbapi.com/?t=The
  Terminator&apikey=eba65681&type=movie&plot=short&r=js
  on": {"Title": "The Terminator", "Year": "1984",
  "Rated": "R", "Released": "26 Oct 1984", "Runtime":
  "107 min", "Genre": "Action, Sci-Fi", "Director":
  "James Cameron", "Writer": "James Cameron, Gale Anne
  Hurd, William Wisher", "Actors": "Arnold
  Schwarzenegger, Linda Hamilton, Michael Biehn",
  "Plot": "A human soldier is sent from 2029 to 1984
  to stop an almost indestructible cyborg killing
  machine, sent from the same year, which has been
  programmed to execute a young woman whose unborn son
  is the key to humanity's future salvat...",
  "Language": "English, Spanish", "Country": "United
  Kingdom, United States", "Awards": "8 wins & 6
  nominations", "Poster": "https://m.media-
  amazon.com/images/M/MV5BYTViNzMxZjEtZGEwNy00MDNiLWIzN
  GQtZDY2MjQ1OWViZjFmXkEyXkFqcGdeQXVyNzkwMjQ5NzM@._V1_S
  X300.jpg", "Ratings": [{"Source": "Internet Movie
  Database", "Value": "8.1/10"}, {"Source": "Rotten
  Tomatoes", "Value": "100%"}, {"Source":
  "Metacritic", "Value": "84/100"}], "Metascore":
  "84", "imdbRating": "8.1", "imdbVotes": "857,862",
  "imdbID": "tt0088247", "Type": "movie", "DVD": "02
  Oct 2001", "BoxOffice": "$38,371,200", "Production":
  "N/A", "Website": "N/A", "Response": "True"},
  "http://www.omdbapi.com/?t=Monsters,
  Inc.&apikey=eba65681&type=movie&plot=short&r=json":
  {"Title": "Monsters, Inc.", "Year": "2001", "Rated":
  "G", "Released": "02 Nov 2001", "Runtime": "92 min",
```

Line: 1 Column: 29322

New document 2

text | tree | table

```
{
  http://www.omdbapi.com/?t=The                                    : {
  Terminator&apikey=eba65681&type=movie&plot=short&r=json
      Title : The Terminator
      Year : 1984
      Rated : R
      Released : 26 Oct 1984
      Runtime : 107 min
      Genre : Action, Sci-Fi
      Director : James Cameron
      Writer : James Cameron, Gale Anne Hurd, William Wisher
      Actors : Arnold Schwarzenegger, Linda Hamilton,
               Michael Biehn
      Plot : A human soldier is sent from 2029 to 1984 to
             stop an almost indestructible cyborg killing
             machine, sent from the same year, which has
             been programmed to execute a young woman whose
             unborn son is the key to humanity's future
             salvat...
      Language : English, Spanish
      Country : United Kingdom, United States
      Awards : 8 wins & 6 nominations
      Poster : https://m.media-
               amazon.com/images/M/MV5BYTViNzMxZjEtZGEwNy00M
               DNiLWIzNGQtZDY2MjQ1OWViZjFmXkEyXkFqcGdeQXVyNz
               kwMjQ5NzM@._V1_SX300.jpg
    ▶ Ratings : [ 3 items ]
      Metascore : 84
      imdbRating : 8.1
      imdbVotes : 857,862
```

Copy

<   >

Transform

<   >

Differences

☑ Compare

0 differences

∧   ∨

Clone Discussion 10

- Go to Canvas > Assignments > Discussion 10

- Clone Discussion 10 assignment: https://classroom.github.com/a/jmVo878v

Today's Tasks

- Use the provided JSON document (books.json)
- **TASK 1**: Write a function **read_json(file)** that reads a JSON document, decodes the file content, and returns a dictionary.
- **TASK 2**: Write a function **get_longest_book(data)** that returns the title of the book with the most pages.
  - e.g. 'Infinite Jest'
- **TASK 3**: Write a function **author_by_letter(letter, data)** that returns a dictionary where the keys are authors whose last name begins with the specified letter and the values are their books
  - e.g. author_by_letter('D', books) = {'Joan Didion': 'Play It As It Lays', 'Don DeLillo': 'White Noise'}
- **TASK 4**: Write a function **get_new_editions(data)** to return a list of books published since 2020
  - e.g. ['Best American Essays 2021', 'Empire of Pain', 'Klara and the Sun']