



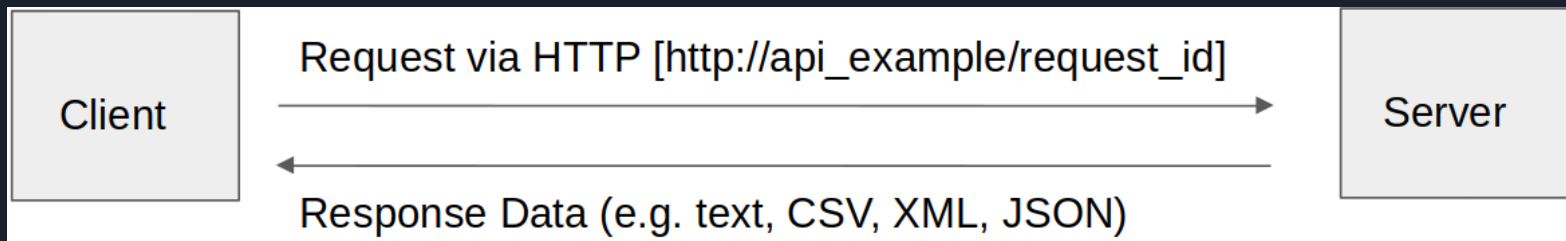
Python Web APIs Demo

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Scholarly APIs

Scholarly APIs allow users to access data (machine-readable) and information programmatically. Many are based on RESTful web APIs, and are reasonable to work with limited programming experience:



Many Scholarly APIs are available such as through Scopus, PubMed, Crossref, and Hathitrust.



Machine-readable data

From Wikipedia:

“Machine-readable data, or computer-readable data, is data (or metadata) in a format that can be easily processed by a computer.”

APIs will often have return options such as plain text, XML, and JSON.

Example JSON from PubChem API call:
<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/5978/property/MolecularFormula/JSON>

```
{
  "PropertyTable": {
    "Properties": [
      {
        "CID": 5978,
        "MolecularFormula": "C46H56N4O10"
      }
    ]
  }
}
```



Available APIs

Scholarly APIs

<https://guides.lib.ua.edu/c.php?g=1201640&p=8787138>

Other Public APIs

<https://github.com/public-apis/public-apis>



What does it look like

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/2244/property/MolecularFormula/JSON>

We usually test out API calls in a browser, before moving to a programming script



API URLs

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/2244/property/MolecularFormula/JSON>

Base URL

Input

Operation

Output



Documentation

https://pubchemdocs.ncbi.nlm.nih.gov/pug-rest#_Toc494865554

<input specification> = <domain>/<namespace>/<identifiers>
 compound/cid/2244



Input

compound/cid/2244 -> compound/cid/1584

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/1584/property/MolecularFormula/JSON>

compound/cid/2244 -> compound/cid/2244,1584,1588

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/2244,1584,1588/property/MolecularFormula/JSON>



Documentation

https://pubchemdocs.ncbi.nlm.nih.gov/pug-rest#_Toc494865554

<compound property> = **property** / [list of property tags]

property/MolecularFormula

<output specification> = XML | JSON | CSV | PNG | TXT

/JSON



Output

property/MolecularFormula/JSON -> property/InChIKey/JSON

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/2244/property/InChIKey/JSON>

property/MolecularFormula/JSON -> property/MolecularFormula/TXT

<https://pubchem.ncbi.nlm.nih.gov/rest/pug/compound/cid/2244/property/InChIKey/TXT>



Python Must Knows

Importing Libraries

- `import Requests`
- `import pprint (optional)`

Calling API

- `requests.get(url).json()`

Indexing

- `data[indexValue]`

Demo: Plotting States

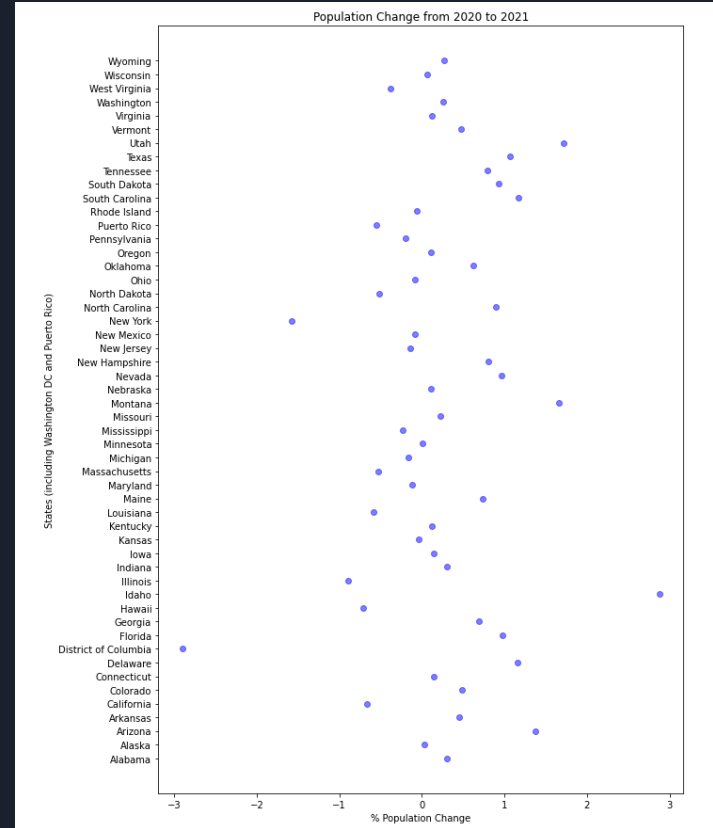
This data is based off the U.S. Census API, the 2021 Population Estimates dataset:

<https://api.census.gov/data/2021/pep/population/variables.html>

The percentage change in population is from July 1, 2020 to July 1, 2021 for states (includes Washington, D.C. and Puerto Rico)

<https://api.census.gov/data/2021/pep/population/examples.html>

https://ualibweb.github.io/UALIB_ScholarlyAPI_Cookbook/content/scripts/python/python_uscensus.html





Scholarly API Cookbook

For more API and code script examples, see our Cookbook:

https://ualibweb.github.io/UALIB_ScholarlyAPI_Cookbook