

# POWER BI, SYNAPSE AND GOVERNMENT API DATA

---

RUSS LOSKI

# INTRODUCTION

---

- Russ Loski
- Data Engineer
- Husband, dad and grandad
- [russloski@sqlmovers.com](mailto:russloski@sqlmovers.com)
- [www.sqlmovers.com](http://www.sqlmovers.com)
- <https://twitter.com/sqlmovers>
- <https://www.linkedin.com/in/russloski>
- Slides and Code: <http://bit.ly/42yn3GO>
- <https://github.com/rloski-public/Presentations/tree/main/>



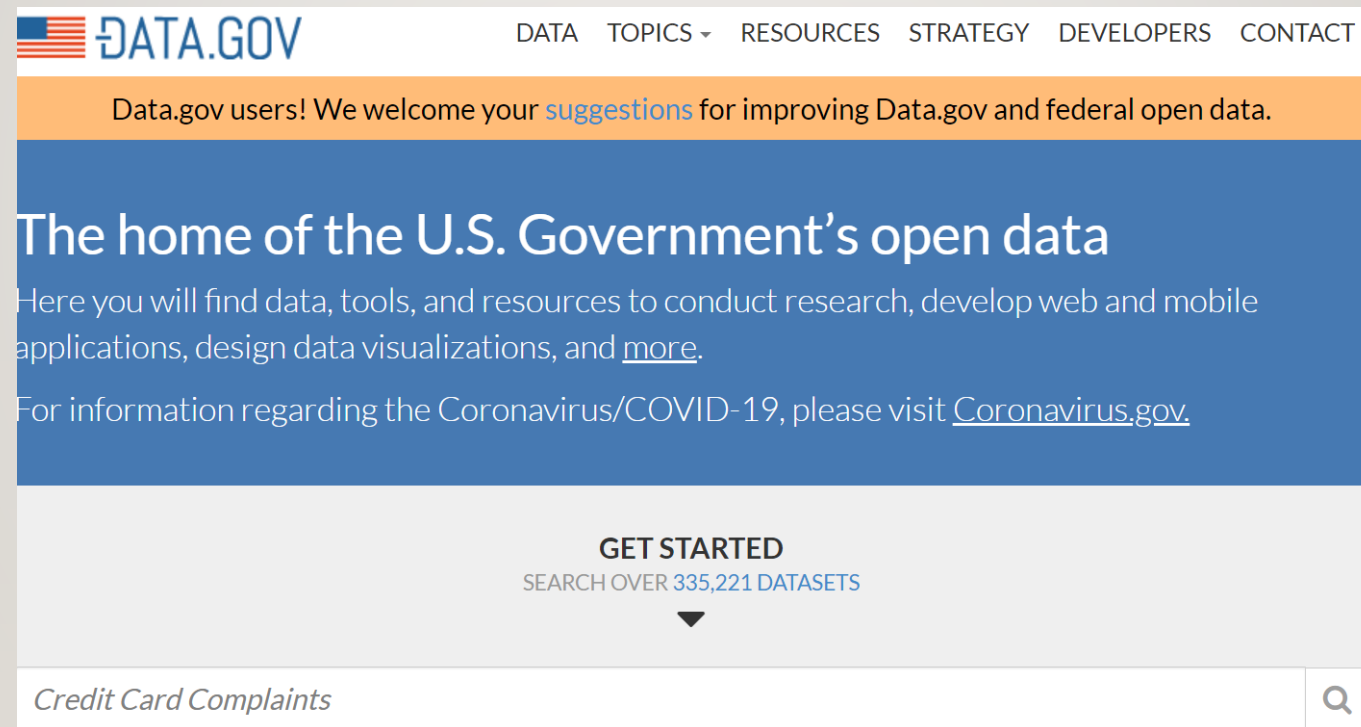
# AGENDA

---

- Introduction to government data
- APIs
- PUMS API
- PUMS Metadata API
- CMS Marketplace API

# GOVERNMENT DATA

- [Data.gov](https://data.gov)



# FINDING APIS

- [Census Data API Discovery Tool](#)

Title	Description	Vintage	Dataset Name	Dataset Type	Geography List	Variable List	Group List	SortList	Examples	Developer Document
1986 County Business Patterns: Business Patterns	County Business Patterns (CBP) is an annual series that provides economic data by industry at the U.S., State, County and Metropolitan Area levels. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. CBP provides statistics for businesses with paid employees for the U.S., Puerto Rico, and the Island Areas. Census Bureau staff identified a processing error that affects selected data from the 2014 County Business Patterns (CBP). As a result, we suppressed 2014 employment and payroll totals in the Health Care and Social Assistance sector (Sector 62) for the following geographies: U.S.; Michigan; Battle Creek, MI metro area; Calhoun County, MI; and the 3rd congressional district of Michigan. This processing error did not affect other sectors. While suppressed values can be derived by subtraction, we do not recommend using the derived values in any analyses. The Census Bureau plans to release revised statistics at a later date.	1986	cbp	Aggregate	<a href="#">geographies</a>	<a href="#">variables</a>	<a href="#">groups</a>	<a href="#">sorts</a>	<a href="#">examples</a>	<a href="#">documenta</a>



# DATA SOURCES: ACS

---

- American Community Surveys (ACS)
  - [American Community Survey \(ACS\) \(census.gov\)](https://www.census.gov/programs-surveys/acs/index.html)
- Public Use Microdata Sample (PUMS)
  - [American Community Survey Microdata \(census.gov\)](https://www.census.gov/programs-surveys/acs/data/pums.html)
- FTP Site
  - [Index of /programs-surveys/acs/data/pums \(census.gov\)](https://www.census.gov/programs-surveys/acs/data/pums.html)

# DATA SOURCE: BLS CPS

---

- US Bureau of Labor Statistics Current Population Survey
- [CPS Home : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/cps/)

# CPS TABLES

---

- [CPS Tables : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/cps/tables/)
- [Current Population Survey Datasets \(census.gov\)](https://www.census.gov/data/tables/5yr/cps.html)
- [Basic Monthly CPS \(census.gov\)](https://www.census.gov/data/tables/5yr/cps.html)



# WHY USE API?

---

- More immediate data; closer to streaming
- Targeted import of data

# ISSUES WITH API

---

- Parsing the data returned
- Authentication
  - **GET THE KEY**
- Posting data
- Understanding the requirements
- Understanding the restrictions

# CENSUS MICRODATA API

---

- [Census Microdata API](#)
- Request a key: [Key Signup \(census.gov\)](#)
- Documentation for using the APIs
  - [Census Data API User Guide](#)

# RESOURCES FOR THE MICRODATA

---

- [Census Microdata API](#)

## **2021 ACS 1-Year Estimates - Public Use Microdata Sample**

- **Example Call:** [api.census.gov/data/2021/acs/acs1/pums?get=SEX,PWGTP,MAR&SCHL=24&key=YOUR\\_KEY\\_GOES\\_HERE](https://api.census.gov/data/2021/acs/acs1/pums?get=SEX,PWGTP,MAR&SCHL=24&key=YOUR_KEY_GOES_HERE)
- 2021 ACS 1-Year Public Use Microdata Sample Variables [ [html](#) | [xml](#) | [json](#) ]
- [Examples](#)
- [Supported Geography](#)

## **2021 ACS 1-Year Estimates - Puerto Rico Public Use Microdata Sample**

# PYTHON TO CONNECT USING SPARK

---

- [How to Execute a REST API call on Apache Spark the Right Way | by James S Hocking | Geek Culture | Aug, 2021 | Medium | Geek Culture](#)
- [REST API to Spark Dataframe \(datanoon.com\)](#)



# PUMS URL

---

- 'https://api.census.gov/data/2021/acs/acs1/pums?get=WGTP,FHICOV&HHLDRHISP=02:99&key=' + PUMSKey
  - Address: https://api.census.gov/
  - Path: data/2021/acs/acs1/pums
  - Query arguments: ?get=WGTP,FHICOV&HHLDRHISP=02:99&key=

# PUMS RESULTS

---

```
✓
1 results
✓ - Command executed in 211 ms on 7:47:40 PM, 3/10
5]
• [[ 'WGTP', 'FHICOVP', 'HHLDRHISP'],
  ['283', '0', '3'],
  ['31', '0', '2'],
  ['31', '0', '2'],
  ['31', '0', '2'],
  ['82', '0', '2'],
  ['82', '0', '2'],
  ['170', '0', '2'],
  ['170', '1', '2'],
  ['170', '1', '2'],
  ['170', '1', '2'],
  ['170', '1', '2'],
  ['170', '1', '2'],
  ['137', '0', '2'],
  ['137', '0', '2'],
  ['137', '0', '2'],
  ['137', '0', '2'],
```

# PUMS METADATA API

---

- `'https://api.census.gov/data/2021/acs/acs1/pums/variables.json'`

```
1 results
[10] ✓ - Command executed in 736 ms on 8:40:13 PM, 3/14/23
... {'variables': {'for': {'label': "Census API FIPS 'for' clause",
    'concept': 'Census API Geography Specification',
    'predicateType': 'fips-for',
    'group': 'N/A',
    'limit': 0,
    'predicateOnly': True},
    'in': {'label': "Census API FIPS 'in' clause",
    'concept': 'Census API Geography Specification',
    'predicateType': 'fips-in',
    'group': 'N/A',
    'limit': 0,
    'predicateOnly': True},
    'ucgid': {'label': 'Uniform Census Geography Identifier clause',
    'concept': 'Census API Geography Specification',
```



# BREAK LOGJAM

---





# EXPLODE

---

- explode



# EXPLODE

---

- explode

# PUMS METADATA POWER QUERY

---

let

Source = Json.Document(Web.Contents("https://api.census.gov/data/"

& "2021"

& "/acs/acs1/pums/variables.json"

& "?key="

& Govkey)),

variables = Record.ToTable(Source[variables]),

#"Expanded Value" = Table.ExpandRecordColumn(variables, "Value", {"label", "concept", "predicateType", "group", "limit", "predicateOnly"}, {"label", "concept", "predicateType", "group", "limit", "predicateOnly"})

in

#"Expanded Value"

# CMS MARKETPLACE

---

- [CMS Developer Tools](#)
- [Marketplace API \(cms.gov\)](#)
- Key Request: [Marketplace API Key Request \(cms.gov\)](#)
- Documentation: [API Specifications - Marketplace API \(cms.gov\)](#)



# REQUEST COMPONENTS

---

- https://
- marketplace.api.healthcare.gov/
- api/v1/plans/search?apikey=

```
{  
  "household": {  
    "income": 52000,  
    "people": [  
      {  
        "age": 27,  
        "aptc_eligible": True,  
        "gender": "Female",  
        "uses_tobacco": False}},...
```

# RESULTS

---

1 results

✓ - Command executed in 194 ms on 8:36:31 PM, 3/16/23

```
{'plans': [{ 'id': '19636LA0230006',  
  'name': 'Community Blue 70/50 $4500',  
  'premium': 263.91,  
  'premium_w_credit': 263.91,  
  'ehb_premium': 263.91,  
  'pediatric_ehb_premium': 0,  
  'aptc_eligible_premium': 263.91,  
  'metal_level': 'Bronze',  
  'type': 'POS',  
  'state': 'LA',  
  'benefits': [{ 'name': 'Primary Care Visit to Treat an Injury or Illness',  
    'covered': True,
```

# CURRENT POPULATION SURVEY BASIC MONTHLY

---

- [CPS Basic Monthly \(census.gov\)](https://www.census.gov/cps/cps.html)

# CPS API

---

- [Getting Started : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/cps-api/getting-started)

# WEATHER API

---

- [API Web Service \(weather.gov\)](#)
- Try it out: [API Web Service \(weather.gov\)](#)



# AMERICA TIME USE SURVEY

---

- [ATUS home : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/atus/)
- [Obtaining ATUS Data : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/atus/data/)

# CONNECT

---

- Russ Loski
- Data Engineer
- Husband, dad and grandad
- [russloski@sqlmovers.com](mailto:russloski@sqlmovers.com)
- [www.sqlmovers.com](http://www.sqlmovers.com)
- <https://twitter.com/sqlmovers>
- <https://www.linkedin.com/in/russloski>
- Slides and Code: <http://bit.ly/42yn3GO>
- <https://github.com/rloski-public/Presentations/tree/main/>

