APIs

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What is an API?

▶ **A**pplication **P**rogramming **I**nterface
▶ We are accessing data stored remotely (like MySQL) but the data is not organized into a database
▶ Access the data via a URL with modifications which represent the parameters we want to pull data about.

Where Can you Find APIs?

▶ https://github.com/public-apis/public-apis
▶ Note that some APIs require an API key (like a log in), some require it at a certain level of data acqusition

Libraries

▶ `urllib`: Used to access the data stored in an API by URL address

▶ `json`: Used as an intermiate state between what is returned from an API and putting the data into a Pandas Dataframe.

▶ `PIL`: Used to display images

API URL Formatting

```
base_url + modifications
```

- ▶ Modifications control the exact data that is returned by the API
- ▶ Typically a / or ? exist between the base url and the modifications

CatAAS API

- Cats As A Service: API for retrieving images of cats
- Funny use case, but works the same as many other APIs
- **To Jupyter!**

Census API

▶ Main Webpage:
https://www.census.gov/data/developers/data-sets.html

▶ Economic Indicator Data:
https://www.census.gov/data/developers/data-sets/economic-indicators.html

Economic Indicators Data Sets

Indicator Dataset	Abbreviation
Construction Spending (VIP)	vip
New Residential Sales (NRS)	ressales
New Residential Construction (NRC)	resconst
Monthly Wholesale Trade Inventories (MWTS)	mwts
Advance Monthly Retail Sales (MARTS)	marts
Monthly Trade & Inventory Sales (MTIS)	mtis
Monthly Retail Sales (MRTS)	mrts
Advance Report on Durable Goods (ADVM3)	advm3
Manufacturer's Shipments Inventories & Orders (M3)	m3
International Trade (FTD)	ftd
Housing Vacancies & Homeownership Rate (HV)	hv

Figure 1: Economic Indicators Data Sets

Housing Value Variables

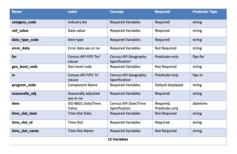| Name	Label	Concept	Required	Predicate Type
category_code	Industry list	Required Variables	Required	string
cell_value	Data value	Required Variables	Required	string
data_type_code	Item type	Required Variables	Required	string
error_data	Error data yes or no	Required Variables	Not Required	string
for	Census API FIPS 'for' clause	Census API Geography Specification	Predicate-only	fips-for
geo_level_code	Geo level code	Required Variables	Not Required	string
in	Census API FIPS 'in' clause	Census API Geography Specification	Predicate-only	fips-in
program_code	Component Name	Required Variables	Default displayed	string
seasonally_adj	Seasonally adjusted yes or no	Required Variables	Required	string
time	ISO-8601 Date/Time Value	Census API Date/Time Specification	Required, Predicate-only	datetime
time_slot_date	Time Slot Data	Required Variables	Not Required	string
time_slot_id	Time Slot	Required Variables	Required	string
time_slot_name	Time Slot Name	Required Variables	Not Required	string
13 Variables				

Figure 2: Housing Value Variables

URL Format

`https://api.census.gov/data/timeseries/AREA/DATA SET?get=VARIA`

- ▶ Comma separated variables do not require an input
- ▶ Ampersand separated variables could take an input in the for statement (but do not have to)

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