A few practice questions to get you started on using COVIDCast.

COVIDCast only have a small number of methods that you need to learn. The documentation of the methods can be found here: https://cmu-delphi.github.io/covidcast/covidcast-py/html/signals.html

```
# Installing covidcast
!pip install covidcast
```

```
Collecting covidcast
  Downloading covidcast-0.1.5-py3-none-any.whl (12.3 MB)
     |████████████████████████████████| 12.3 MB 3.8 MB/s
Collecting geopandas
  Downloading geopandas-0.10.2-py2.py3-none-any.whl (1.0 MB)
     |████████████████████████████████| 1.0 MB 68.2 MB/s
Collecting delphi-epidata>=0.0.11
  Downloading delphi_epidata-0.3.1-py3-none-any.whl (6.8 kB)
Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages
Collecting epiweeks
  Downloading epiweeks-2.1.3-py3-none-any.whl (5.9 kB)
Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages
Collecting imageio-ffmpeg
  Downloading imageio_ffmpeg-0.4.5-py3-none-manylinux2010_x86_64.whl (26.9 MB)
     |████████████████████████████████| 26.9 MB 74.9 MB/s
Requirement already satisfied: imageio in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: descartes in /usr/local/lib/python3.7/dist-packag
Requirement already satisfied: numpy in /usr/local/lib/python3.7/dist-packages (
Requirement already satisfied: matplotlib in /usr/local/lib/python3.7/dist-packa
Collecting aiohttp
  Downloading aiohttp-3.8.1-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.ma
     |████████████████████████████████| 1.1 MB 43.2 MB/s
Collecting tenacity
  Downloading tenacity-8.0.1-py3-none-any.whl (24 kB)
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in /usr/l
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/di
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dis
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-pac
Collecting frozenlist>=1.1.1
  Downloading frozenlist-1.2.0-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64
     |████████████████████████████████| 192 kB 55.5 MB/s
Collecting asynctest==0.13.0
  Downloading asynctest-0.13.0-py3-none-any.whl (26 kB)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: typing-extensions>=3.7.4 in /usr/local/lib/python
Collecting yarl<2.0,>=1.0
  Downloading yarl-1.7.2-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.manyl
     |████████████████████████████████| 271 kB 49.5 MB/s
Requirement already satisfied: charset-normalizer<3.0,>=2.0 in /usr/local/lib/py
Collecting aiosignal>=1.1.2
  Downloading aiosignal-1.2.0-py3-none-any.whl (8.2 kB)
Collecting async-timeout<5.0,>=4.0.0a3
  Downloading async_timeout-4.0.1-py3-none-any.whl (5.7 kB)
```

```
Collecting multidict<7.0,>=4.5
  Downloading multidict-5.2.0-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.
     |████████████████████████████████| 160 kB 59.5 MB/s
Collecting pyproj>=2.2.0
  Downloading pyproj-3.2.1-cp37-cp37m-manylinux2010_x86_64.whl (6.3 MB)
     |████████████████████████████████| 6.3 MB 19.1 MB/s
Requirement already satisfied: shapely>=1.6 in /usr/local/lib/python3.7/dist-pac
Collecting fiona>=1.8
  Downloading Fiona-1.8.20-cp37-cp37m-manylinux1_x86_64.whl (15.4 MB)
     |████████████████████████████████| 15.4 MB 19.7 MB/s
Collecting cligj>=0.5
  Downloading cligj-0.7.2-py3-none-any.whl (7.1 kB)
Collecting munch
  Downloading munch-2.5.0-py2.py3-none-any.whl (10 kB)
```

```
from datetime import date
import covidcast
```

Working with geographic codes

Get the FIPS codes for Los Angeles county, Santa Barbara county, and Orange county.

```
covidcast.name_to_fips(["Los Angeles", "Santa Barbara", "Orange"])
```

```
/usr/local/lib/python3.7/dist-packages/covidcast/geography.py:314: UserWarning: S
  warnings.warn("Some inputs were not uniquely matched; returning only the first
['06037', '06083', '06059']
```

FIPS codes

Los Angeles county : 06037

Santa Barbara county : 06083

Orange county : 06059

Find out which counties correspond to the FIPS 06059 and 42003.

```
county1 = covidcast.fips_to_name("06059")
county2 = covidcast.fips_to_name("42003")
county1, county2
```

```
(['Orange County'], ['Allegheny County'])
```

Counties:

06059 : Orange County

42003 : Allegheny County

Find the FIPS of all counties in California. Create and print out a dictionary that maps county names to FIPS for all the counties in California. Hint: Look at the last example from https://cmu-delphi.github.io/covidcast/covidcast-py/html/getting_started.html.

```
covidcast.abbr_to_fips('CA') # checks the FIPS of California
ca_counties = covidcast.fips_to_name("^06.*", ties_method="all")
ca_counties
```

```
[{'06000': ['California'],
  '06001': ['Alameda County'],
  '06003': ['Alpine County'],
  '06005': ['Amador County'],
  '06007': ['Butte County'],
  '06009': ['Calaveras County'],
  '06011': ['Colusa County'],
  '06013': ['Contra Costa County'],
  '06015': ['Del Norte County'],
  '06017': ['El Dorado County'],
  '06019': ['Fresno County'],
  '06021': ['Glenn County'],
  '06023': ['Humboldt County'],
  '06025': ['Imperial County'],
  '06027': ['Inyo County'],
  '06029': ['Kern County'],
  '06031': ['Kings County'],
  '06033': ['Lake County'],
  '06035': ['Lassen County'],
  '06037': ['Los Angeles County'],
  '06039': ['Madera County'],
  '06041': ['Marin County'],
  '06043': ['Mariposa County'],
  '06045': ['Mendocino County'],
  '06047': ['Merced County'],
  '06049': ['Modoc County'],
  '06051': ['Mono County'],
  '06053': ['Monterey County'],
  '06055': ['Napa County'],
  '06057': ['Nevada County'],
  '06059': ['Orange County'],
  '06061': ['Placer County'],
  '06063': ['Plumas County'],
  '06065': ['Riverside County'],
  '06067': ['Sacramento County'],
  '06069': ['San Benito County'],
  '06071': ['San Bernardino County'],
  '06073': ['San Diego County'],
  '06075': ['San Francisco County'],
  '06077': ['San Joaquin County'],
  '06079': ['San Luis Obispo County'],
```

```
    '06081': ['San Mateo County'],
    '06083': ['Santa Barbara County'],
    '06085': ['Santa Clara County'],
    '06087': ['Santa Cruz County'],
    '06089': ['Shasta County'],
    '06091': ['Sierra County'],
    '06093': ['Siskiyou County'],
    '06095': ['Solano County'],
    '06097': ['Sonoma County'],
    '06099': ['Stanislaus County'],
    '06101': ['Sutter County'],
    '06103': ['Tehama County'],
    '06105': ['Trinity County'],
    '06107': ['Tulare County'],
    '06109': ['Tuolumne County'],
    '06111': ['Ventura County'],
    '06113': ['Yolo County'],
```

Fetching and merging data

Get the number of daily new Covid cases in the California, New York, and Texas from May 2020 to July 2020 by fetching the "US Facts Cases and Deaths" data source (https://cmu-delphi.github.io/delphi-epidata/api/covidcast-signals/usa-facts.html).

```
ca_daily = covidcast.signal('usa-facts', 'confirmed_incidence_num', date(2020, 5, 1) ,
ny_daily = covidcast.signal('usa-facts', 'confirmed_incidence_num', date(2020, 5, 1) ,
tx_daily = covidcast.signal('usa-facts', 'confirmed_incidence_num', date(2020, 5, 1) ,
```

```
ca_daily.head(5)
```

	geo_value	signal	time_value	issue	lag	missing_v
0	ca	confirmed_incidence_num	2020-05-01	2021-09-16	503	
0	ca	confirmed_incidence_num	2020-05-02	2021-09-16	502	
0	ca	confirmed_incidence_num	2020-05-03	2021-09-16	501	

```
ny_daily.head(5)
```

	geo_value	signal	time_value	issue	lag	missing_v
0	ny	confirmed_incidence_num	2020-05-01	2020-10-17	169	

```
tx_daily.head(5)
```

	geo_value	signal	time_value	issue	lag	missing_v
0	tx	confirmed_incidence_num	2020-05-01	2021-10-20	537	
0	tx	confirmed_incidence_num	2020-05-02	2021-10-20	536	
0	tx	confirmed_incidence_num	2020-05-03	2021-10-20	535	

Get the daily percentages of doctor visits that are related to Covid in California, New York, and Texas from May 2020 to July 2020 by fetching the "Doctor Visits" data source (https://cmu-delphi.github.io/delphi-epidata/api/covidcast-signals/doctor-visits.html).

```
doctor_visits_percentage = covidcast.signal('doctor-visits', 'smoothed_cli', date(202(
```

```
doctor_visits_percentage
```

	geo_value	signal	time_value	issue	lag	missing_value	mis
0	ca	smoothed_cli	2020-05-01	2020-07-04	64	0	
1	ny	smoothed_cli	2020-05-01	2020-07-04	64	0	
2	tx	smoothed_cli	2020-05-01	2020-07-04	64	0	
0	ca	smoothed_cli	2020-05-02	2020-07-05	64	0	
1	ny	smoothed_cli	2020-05-02	2020-07-05	64	0	
...	...	...	...	...	...	...	
1	ny	smoothed_cli	2020-06-30	2020-09-01	63	0	
				2020-			

```
daily_new_cases = covidcast.signal('usa-facts', 'confirmed_incidence_num', date(2020,
```

Merge the two tables using the covidcast.aggregate_signals method.

```
daily_new_cases.head()
```

	geo_value	signal	time_value	issue	lag	missing_v
0	ca	confirmed_incidence_num	2020-05-01	2021-09-16	503	
1	ny	confirmed_incidence_num	2020-05-01	2020-10-17	169	
2	tx	confirmed_incidence_num	2020-05-01	2021-10-20	537	

```
new_percentage_agg = covidcast.aggregate_signals([daily_new_cases, doctor_visits_perce
```

```
new_percentage_agg
```

	geo_value	time_value	usa-facts_confirmed_incidence_num_0_issue	f
0	ca	2020-05-01	2021-09-16	
1	ny	2020-05-01	2020-10-17	
2	tx	2020-05-01	2021-10-20	
3	ca	2020-05-02	2021-09-16	
4	ny	2020-05-02	2020-10-17	
...	...	...	...	
181	ny	2020-06-30	2020-10-17	
182	tx	2020-06-30	2021-10-20	
183	ca	2020-07-01	2021-09-16	
184	ny	2020-07-01	2020-10-17	
185	tx	2020-07-01	2021-10-20	

186 rows × 19 columns