Dependencies

```python
In [1]:  import requests
         from bs4 import BeautifulSoup
         from urllib.parse import urljoin

         import pandas as pd
         import seaborn as sns
         import matplotlib.pyplot as plt

         sns.set_style("darkgrid")
```

Scrape and Read the Data

The next three blocks of code will scrape the NY-Times repo for the files that we need and save each csv file as a dataframe within a dictionary

```python
In [2]:  base = "https://raw.githubusercontent.com"
         url = requests.get(
             'https://github.com/nytimes/covid-19-data').text
         soup = BeautifulSoup(url, features="html.parser")
```

```python
In [3]:  # Collects all CSVs from NY Times github and saves within data dictionary
         data_dict = {}

         for link in (urljoin(base, a["href"]) for a in soup.select("a[href$='.csv']"
         )):
             link = link.replace('/blob', '')
             data_dict[link.replace('https://raw.githubusercontent.com/nytimes/covid-19
         -data/master/', '').replace(".csv",
                 "")] = pd.read_csv(link)
```

```
In [4]: for dataframe in data_dict.items():
            print(dataframe)
```

```
('us-counties',             date      county       state      fips  cases  d
eaths
0        2020-01-21    Snohomish  Washington  53061.0      1      0
1        2020-01-22    Snohomish  Washington  53061.0      1      0
2        2020-01-23    Snohomish  Washington  53061.0      1      0
3        2020-01-24         Cook    Illinois  17031.0      1      0
4        2020-01-24    Snohomish  Washington  53061.0      1      0
...             ...          ...         ...      ...    ...    ...
156032   2020-05-18     Sublette     Wyoming  56035.0      3      0
156033   2020-05-18   Sweetwater     Wyoming  56037.0     23      0
156034   2020-05-18        Teton     Wyoming  56039.0    100      1
156035   2020-05-18        Uinta     Wyoming  56041.0     12      0
156036   2020-05-18     Washakie     Wyoming  56043.0     15      0

[156037 rows x 6 columns])
('us-states',             date        state  fips  cases  deaths
0        2020-01-21   Washington    53      1      0
1        2020-01-22   Washington    53      1      0
2        2020-01-23   Washington    53      1      0
3        2020-01-24      Illinois    17      1      0
4        2020-01-24   Washington    53      1      0
...             ...          ...   ...    ...    ...
4244     2020-05-18     Virginia    51  31140   1014
4245     2020-05-18   Washington    53  19838   1020
4246     2020-05-18  West Virginia    54   1502     68
4247     2020-05-18    Wisconsin    55  12722    459
4248     2020-05-18      Wyoming    56    766     10

[4249 rows x 5 columns])
('us',          date    cases  deaths
0     2020-01-21        1       0
1     2020-01-22        1       0
2     2020-01-23        1       0
3     2020-01-24        2       0
4     2020-01-25        3       0
..           ...      ...     ...
114   2020-05-14  1424734   85842
115   2020-05-15  1450963   87435
116   2020-05-16  1474612   88660
117   2020-05-17  1493611   89504
118   2020-05-18  1515373   90293

[119 rows x 3 columns])
('live/us',          date     cases   deaths  confirmed_cases  confirmed_deaths
\
0   2020-05-19  1527557    91153              NaN               NaN

    probable_cases  probable_deaths
0             NaN              NaN  )
('live/us-states',            date                state  fips  cases  de
aths  \
0   2020-05-19                   Alabama     1  12376    504
1   2020-05-19                    Alaska     2    399      8
2   2020-05-19                   Arizona     4  14566    704
3   2020-05-19                  Arkansas     5   4813    100
4   2020-05-19                California     6  82302   3334
5   2020-05-19                  Colorado     8  22174   1224
```

```
6    2020-05-19              Connecticut      9    38116    3449
7    2020-05-19                 Delaware     10     8037     304
8    2020-05-19     District of Columbia     11     7434     400
9    2020-05-19                  Florida     12    46936    2051
10   2020-05-19                  Georgia     13    37056    1639
11   2020-05-19                     Guam     66     1123       6
12   2020-05-19                   Hawaii     15      630      17
13   2020-05-19                    Idaho     16     2455      74
14   2020-05-19                 Illinois     17    96778    4257
15   2020-05-19                  Indiana     18    29402    1824
16   2020-05-19                     Iowa     19    15296     367
17   2020-05-19                   Kansas     20     8450     191
18   2020-05-19                 Kentucky     21     8064     356
19   2020-05-19                Louisiana     22    34709    2440
20   2020-05-19                    Maine     23     1741      73
21   2020-05-19                 Maryland     24    41664    2081
22   2020-05-19            Massachusetts     25    87052    5862
23   2020-05-19                 Michigan     26    51853    4915
24   2020-05-19                Minnesota     27    17038     757
25   2020-05-19              Mississippi     28    11704     554
26   2020-05-19                 Missouri     29    11336     622
27   2020-05-19                  Montana     30      471      16
28   2020-05-19                 Nebraska     31    10625     132
29   2020-05-19                   Nevada     32     7136     364
30   2020-05-19            New Hampshire     33     3652     172
31   2020-05-19               New Jersey     34   149013   10586
32   2020-05-19               New Mexico     35     6096     270
33   2020-05-19                 New York     36   357757   28437
34   2020-05-19           North Carolina     37    19727     708
35   2020-05-19             North Dakota     38     1997      45
36   2020-05-19  Northern Mariana Islands    69       21       2
37   2020-05-19                     Ohio     39    28953    1720
38   2020-05-19                 Oklahoma     40     5489     294
39   2020-05-19                   Oregon     41     3687     138
40   2020-05-19             Pennsylvania     42    67309    4662
41   2020-05-19              Puerto Rico     72     2805     124
42   2020-05-19             Rhode Island     44    12951     532
43   2020-05-19           South Carolina     45     8942     391
44   2020-05-19             South Dakota     46     4085      46
45   2020-05-19                Tennessee     47    18033     299
46   2020-05-19                    Texas     48    49886    1364
47   2020-05-19                     Utah     49     7384      80
48   2020-05-19                  Vermont     50      944      54
49   2020-05-19           Virgin Islands     78       69       6
50   2020-05-19                 Virginia     51    32145    1041
51   2020-05-19               Washington     53    19838    1020
52   2020-05-19            West Virginia     54     1509      68
53   2020-05-19                Wisconsin     55    12763     459
54   2020-05-19                  Wyoming     56      766      10

     confirmed_cases  confirmed_deaths  probable_cases  probable_deaths
0            12376.0               NaN             0.0              NaN
1              399.0               8.0             0.0              0.0
2                NaN               NaN             NaN              NaN
3             4813.0             100.0             0.0              0.0
4            82302.0            3334.0             0.0              0.0
5                NaN               NaN             NaN              NaN
```

```
6          NaN        NaN        NaN        NaN
7          NaN        NaN        NaN        NaN
8       7434.0      400.0        0.0        0.0
9      46936.0     2051.0        0.0        0.0
10     37056.0     1639.0        0.0        0.0
11      1118.0        6.0        5.0        0.0
12         NaN        NaN        NaN        NaN
13      2254.0        NaN      201.0        NaN
14     96778.0     4257.0        0.0        0.0
15     28705.0     1678.0      697.0      146.0
16     15296.0      367.0        0.0        0.0
17         NaN        NaN        NaN        NaN
18         NaN        NaN        NaN        NaN
19     34709.0     2440.0        0.0        0.0
20      1741.0       73.0        0.0        0.0
21     41546.0     1963.0      118.0      118.0
22     87052.0     5862.0        0.0        0.0
23     51853.0        NaN        0.0        NaN
24     17029.0      748.0        9.0        9.0
25     11704.0        NaN        0.0        NaN
26     11336.0      622.0        0.0        0.0
27       471.0       16.0        0.0        0.0
28     10625.0      132.0        0.0        0.0
29      7133.0      364.0        3.0        0.0
30      3652.0      172.0        0.0        0.0
31    149013.0    10586.0        0.0        0.0
32      6096.0      270.0        0.0        0.0
33    352929.0    23609.0     4828.0     4828.0
34     19727.0      708.0        0.0        0.0
35      1997.0       45.0        0.0        0.0
36        21.0        2.0        0.0        0.0
37         NaN        NaN        NaN        NaN
38      5489.0      294.0        0.0        0.0
39      3604.0      138.0       83.0        0.0
40         NaN        NaN        NaN        NaN
41      1207.0       60.0     1598.0       64.0
42     12951.0      532.0        0.0        0.0
43      8942.0      391.0        0.0        0.0
44      4085.0       46.0        0.0        0.0
45     17923.0      299.0      110.0        0.0
46     49782.0     1364.0      104.0        0.0
47      7384.0       80.0        0.0        0.0
48       944.0       54.0        0.0        0.0
49        69.0        6.0        0.0        0.0
50         NaN        NaN        NaN        NaN
51     18905.0     1020.0      933.0        0.0
52      1509.0       68.0        0.0        0.0
53     12763.0      459.0        0.0        0.0
54       577.0        NaN      189.0        NaN  )
('live/us-counties',          date    county    state     fips   cases  d
eaths  \
0      2020-05-19    Autauga   Alabama   1001.0     127     4.0
1      2020-05-19    Baldwin   Alabama   1003.0     262     8.0
2      2020-05-19    Barbour   Alabama   1005.0      90     1.0
3      2020-05-19       Bibb   Alabama   1007.0      51     1.0
4      2020-05-19     Blount   Alabama   1009.0      47     1.0
...           ...        ...       ...      ...     ...     ...
```

```
3012  2020-05-19    Sublette   Wyoming  56035.0       3   0.0
3013  2020-05-19  Sweetwater   Wyoming  56037.0      23   0.0
3014  2020-05-19       Teton   Wyoming  56039.0     100   1.0
3015  2020-05-19       Uinta   Wyoming  56041.0      12   0.0
3016  2020-05-19    Washakie   Wyoming  56043.0      15   0.0

      confirmed_cases  confirmed_deaths  probable_cases  probable_deaths
0               127.0               NaN             NaN              NaN
1               262.0               NaN             NaN              NaN
2                90.0               NaN             NaN              NaN
3                51.0               NaN             NaN              NaN
4                47.0               NaN             NaN              NaN
...               ...               ...             ...              ...
3012              1.0               NaN             2.0              NaN
3013             16.0               NaN             7.0              NaN
3014             69.0               NaN            31.0              NaN
3015              8.0               NaN             4.0              NaN
3016             12.0               NaN             3.0              NaN

[3017 rows x 10 columns])
```

Writing the Dictionary of DataFrame to SQLite DataBase

Create the SQLite Database with sqlalchemy

In [5]:
```python
from sqlalchemy import create_engine, ForeignKey
from sqlalchemy import Column, Date, Integer, String
from sqlalchemy.ext.declarative import declarative_base

engine = create_engine('sqlite:///covid.db', echo=True)
con = engine.connect()
Base = declarative_base()

for key, value in data_dict.items():
    value.to_sql(key, engine, if_exists='replace')
```

```python
from sqlalchemy import create_engine, ForeignKey
from sqlalchemy import Column, Date, Integer, String
from sqlalchemy.ext.declarative import declarative_base
```

```
2020-05-19 17:22:39,583 INFO sqlalchemy.engine.base.Engine SELECT CAST('test
plain returns' AS VARCHAR(60)) AS anon_1
2020-05-19 17:22:39,583 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,585 INFO sqlalchemy.engine.base.Engine SELECT CAST('test
unicode returns' AS VARCHAR(60)) AS anon_1
2020-05-19 17:22:39,585 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,611 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us-counties")
2020-05-19 17:22:39,611 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,613 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us-counties")
2020-05-19 17:22:39,614 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,615 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
qlite_master WHERE type='table' ORDER BY name
2020-05-19 17:22:39,616 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,617 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us-counties")
2020-05-19 17:22:39,617 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,619 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us-counties' AND type = 'table'
2020-05-19 17:22:39,619 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,620 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
n_key_list("us-counties")
2020-05-19 17:22:39,621 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,621 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
n_key_list("us-counties")
2020-05-19 17:22:39,622 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,622 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us-counties' AND type = 'table'
2020-05-19 17:22:39,623 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,625 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("us-counties")
2020-05-19 17:22:39,626 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,626 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us-counties_index")
2020-05-19 17:22:39,627 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,628 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("us-counties")
2020-05-19 17:22:39,629 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,630 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us-counties_index")
2020-05-19 17:22:39,630 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,631 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us-counties' AND type = 'table'
2020-05-19 17:22:39,631 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,634 INFO sqlalchemy.engine.base.Engine
DROP TABLE "us-counties"
2020-05-19 17:22:39,634 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:39,976 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:39,979 INFO sqlalchemy.engine.base.Engine
CREATE TABLE "us-counties" (
        "index" BIGINT,
        date TEXT,
        county TEXT,
```

```
                    state TEXT,
                    fips FLOAT,
                    cases BIGINT,
                    deaths BIGINT
        )


        2020-05-19 17:22:39,980 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:39,986 INFO sqlalchemy.engine.base.Engine COMMIT
        2020-05-19 17:22:39,987 INFO sqlalchemy.engine.base.Engine CREATE INDEX "ix_u
        s-counties_index" ON "us-counties" ("index")
        2020-05-19 17:22:39,987 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:39,993 INFO sqlalchemy.engine.base.Engine COMMIT
        2020-05-19 17:22:40,048 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
        2020-05-19 17:22:41,105 INFO sqlalchemy.engine.base.Engine INSERT INTO "us-co
        unties" ("index", date, county, state, fips, cases, deaths) VALUES (?, ?, ?,
        ?, ?, ?, ?)
        2020-05-19 17:22:41,109 INFO sqlalchemy.engine.base.Engine ((0, '2020-01-21',
        'Snohomish', 'Washington', 53061.0, 1, 0), (1, '2020-01-22', 'Snohomish', 'Wa
        shington', 53061.0, 1, 0), (2, '2020-01-23', 'Snohomish', 'Washington', 5306
        1.0, 1, 0), (3, '2020-01-24', 'Cook', 'Illinois', 17031.0, 1, 0), (4, '2020-0
        1-24', 'Snohomish', 'Washington', 53061.0, 1, 0), (5, '2020-01-25', 'Orange',
        'California', 6059.0, 1, 0), (6, '2020-01-25', 'Cook', 'Illinois', 17031.0,
        1, 0), (7, '2020-01-25', 'Snohomish', 'Washington', 53061.0, 1, 0)  ... displ
        aying 10 of 156037 total bound parameter sets ...  (156035, '2020-05-18', 'Ui
        nta', 'Wyoming', 56041.0, 12, 0), (156036, '2020-05-18', 'Washakie', 'Wyomin
        g', 56043.0, 15, 0))
        2020-05-19 17:22:41,654 INFO sqlalchemy.engine.base.Engine COMMIT
        2020-05-19 17:22:41,675 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
        info("us-states")
        2020-05-19 17:22:41,676 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,677 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
        info("us-states")
        2020-05-19 17:22:41,678 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,679 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
        qlite_master WHERE type='table' ORDER BY name
        2020-05-19 17:22:41,680 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,681 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
        info("us-states")
        2020-05-19 17:22:41,682 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,684 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
        (SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
        ERE name = 'us-states' AND type = 'table'
        2020-05-19 17:22:41,685 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,686 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
        n_key_list("us-states")
        2020-05-19 17:22:41,687 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,687 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
        n_key_list("us-states")
        2020-05-19 17:22:41,688 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,688 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
        (SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
        ERE name = 'us-states' AND type = 'table'
        2020-05-19 17:22:41,689 INFO sqlalchemy.engine.base.Engine ()
        2020-05-19 17:22:41,691 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
        list("us-states")
        2020-05-19 17:22:41,692 INFO sqlalchemy.engine.base.Engine ()
```

```
2020-05-19 17:22:41,693 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us-states_index")
2020-05-19 17:22:41,694 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,696 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("us-states")
2020-05-19 17:22:41,696 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,698 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us-states_index")
2020-05-19 17:22:41,698 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,699 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us-states' AND type = 'table'
2020-05-19 17:22:41,700 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,702 INFO sqlalchemy.engine.base.Engine
DROP TABLE "us-states"
2020-05-19 17:22:41,703 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,721 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,724 INFO sqlalchemy.engine.base.Engine
CREATE TABLE "us-states" (
        "index" BIGINT,
        date TEXT,
        state TEXT,
        fips BIGINT,
        cases BIGINT,
        deaths BIGINT
)


2020-05-19 17:22:41,725 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,730 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,731 INFO sqlalchemy.engine.base.Engine CREATE INDEX "ix_u
s-states_index" ON "us-states" ("index")
2020-05-19 17:22:41,732 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,739 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,742 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
2020-05-19 17:22:41,764 INFO sqlalchemy.engine.base.Engine INSERT INTO "us-st
ates" ("index", date, state, fips, cases, deaths) VALUES (?, ?, ?, ?, ?, ?)
2020-05-19 17:22:41,764 INFO sqlalchemy.engine.base.Engine ((0, '2020-01-21',
'Washington', 53, 1, 0), (1, '2020-01-22', 'Washington', 53, 1, 0), (2, '2020
-01-23', 'Washington', 53, 1, 0), (3, '2020-01-24', 'Illinois', 17, 1, 0),
(4, '2020-01-24', 'Washington', 53, 1, 0), (5, '2020-01-25', 'California', 6,
1, 0), (6, '2020-01-25', 'Illinois', 17, 1, 0), (7, '2020-01-25', 'Washingto
n', 53, 1, 0)  ... displaying 10 of 4249 total bound parameter sets ...  (424
7, '2020-05-18', 'Wisconsin', 55, 12722, 459), (4248, '2020-05-18', 'Wyomin
g', 56, 766, 10))
2020-05-19 17:22:41,777 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,787 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us")
2020-05-19 17:22:41,787 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,789 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us")
2020-05-19 17:22:41,789 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,791 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
qlite_master WHERE type='table' ORDER BY name
2020-05-19 17:22:41,792 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,793 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("us")
```

```
2020-05-19 17:22:41,793 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,794 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us' AND type = 'table'
2020-05-19 17:22:41,795 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,796 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
n_key_list("us")
2020-05-19 17:22:41,796 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,797 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
n_key_list("us")
2020-05-19 17:22:41,798 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,799 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us' AND type = 'table'
2020-05-19 17:22:41,800 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,801 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("us")
2020-05-19 17:22:41,802 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,803 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us_index")
2020-05-19 17:22:41,803 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,804 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("us")
2020-05-19 17:22:41,805 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,806 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_us_index")
2020-05-19 17:22:41,806 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,807 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'us' AND type = 'table'
2020-05-19 17:22:41,808 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,810 INFO sqlalchemy.engine.base.Engine
DROP TABLE us
2020-05-19 17:22:41,810 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,817 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,820 INFO sqlalchemy.engine.base.Engine
CREATE TABLE us (
        "index" BIGINT,
        date TEXT,
        cases BIGINT,
        deaths BIGINT
)


2020-05-19 17:22:41,820 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,827 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,827 INFO sqlalchemy.engine.base.Engine CREATE INDEX ix_us
_index ON us ("index")
2020-05-19 17:22:41,828 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,833 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,837 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
2020-05-19 17:22:41,838 INFO sqlalchemy.engine.base.Engine INSERT INTO us ("i
ndex", date, cases, deaths) VALUES (?, ?, ?, ?)
2020-05-19 17:22:41,839 INFO sqlalchemy.engine.base.Engine ((0, '2020-01-21',
1, 0), (1, '2020-01-22', 1, 0), (2, '2020-01-23', 1, 0), (3, '2020-01-24', 2,
0), (4, '2020-01-25', 3, 0), (5, '2020-01-26', 5, 0), (6, '2020-01-27', 5,
0), (7, '2020-01-28', 5, 0)  ... displaying 10 of 119 total bound parameter s
```

```
ets ...  (117, '2020-05-17', 1493611, 89504), (118, '2020-05-18', 1515373, 90
293))
2020-05-19 17:22:41,841 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,849 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us")
2020-05-19 17:22:41,850 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,852 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us")
2020-05-19 17:22:41,853 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,854 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
qlite_master WHERE type='table' ORDER BY name
2020-05-19 17:22:41,855 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,856 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us")
2020-05-19 17:22:41,857 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,858 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us' AND type = 'table'
2020-05-19 17:22:41,858 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,860 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
n_key_list("live/us")
2020-05-19 17:22:41,860 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,861 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
n_key_list("live/us")
2020-05-19 17:22:41,861 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,862 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us' AND type = 'table'
2020-05-19 17:22:41,862 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,863 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us")
2020-05-19 17:22:41,864 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,864 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us_index")
2020-05-19 17:22:41,865 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,867 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us")
2020-05-19 17:22:41,868 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,869 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us_index")
2020-05-19 17:22:41,870 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,871 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us' AND type = 'table'
2020-05-19 17:22:41,871 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,873 INFO sqlalchemy.engine.base.Engine
DROP TABLE "live/us"
2020-05-19 17:22:41,874 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,880 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,882 INFO sqlalchemy.engine.base.Engine
CREATE TABLE "live/us" (
        "index" BIGINT,
        date TEXT,
        cases BIGINT,
        deaths BIGINT,
        confirmed_cases FLOAT,
        confirmed_deaths FLOAT,
```

```
            probable_cases FLOAT,
            probable_deaths FLOAT
)
```

```
2020-05-19 17:22:41,884 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,889 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,890 INFO sqlalchemy.engine.base.Engine CREATE INDEX "ix_l
ive/us_index" ON "live/us" ("index")
2020-05-19 17:22:41,890 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,896 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,898 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
2020-05-19 17:22:41,899 INFO sqlalchemy.engine.base.Engine INSERT INTO "live/
us" ("index", date, cases, deaths, confirmed_cases, confirmed_deaths, probabl
e_cases, probable_deaths) VALUES (?, ?, ?, ?, ?, ?, ?, ?)
2020-05-19 17:22:41,900 INFO sqlalchemy.engine.base.Engine (0, '2020-05-19',
1527557, 91153, None, None, None, None)
2020-05-19 17:22:41,902 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,908 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-states")
2020-05-19 17:22:41,909 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,910 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-states")
2020-05-19 17:22:41,911 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,912 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
qlite_master WHERE type='table' ORDER BY name
2020-05-19 17:22:41,912 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,913 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-states")
2020-05-19 17:22:41,914 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,915 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-states' AND type = 'table'
2020-05-19 17:22:41,915 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,916 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
n_key_list("live/us-states")
2020-05-19 17:22:41,917 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,918 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
n_key_list("live/us-states")
2020-05-19 17:22:41,919 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,920 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-states' AND type = 'table'
2020-05-19 17:22:41,920 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,921 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us-states")
2020-05-19 17:22:41,922 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,923 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us-states_index")
2020-05-19 17:22:41,923 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,924 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us-states")
2020-05-19 17:22:41,925 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,926 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us-states_index")
2020-05-19 17:22:41,926 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,927 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
```

```
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-states' AND type = 'table'
2020-05-19 17:22:41,927 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,928 INFO sqlalchemy.engine.base.Engine
DROP TABLE "live/us-states"
2020-05-19 17:22:41,929 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,934 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,937 INFO sqlalchemy.engine.base.Engine
CREATE TABLE "live/us-states" (
        "index" BIGINT,
        date TEXT,
        state TEXT,
        fips BIGINT,
        cases BIGINT,
        deaths BIGINT,
        confirmed_cases FLOAT,
        confirmed_deaths FLOAT,
        probable_cases FLOAT,
        probable_deaths FLOAT
)


2020-05-19 17:22:41,938 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,943 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,944 INFO sqlalchemy.engine.base.Engine CREATE INDEX "ix_l
ive/us-states_index" ON "live/us-states" ("index")
2020-05-19 17:22:41,944 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,950 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,952 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
2020-05-19 17:22:41,954 INFO sqlalchemy.engine.base.Engine INSERT INTO "live/
us-states" ("index", date, state, fips, cases, deaths, confirmed_cases, confi
rmed_deaths, probable_cases, probable_deaths) VALUES (?, ?, ?, ?, ?, ?, ?, ?,
?, ?)
2020-05-19 17:22:41,955 INFO sqlalchemy.engine.base.Engine ((0, '2020-05-19',
'Alabama', 1, 12376, 504, 12376.0, None, 0.0, None), (1, '2020-05-19', 'Alask
a', 2, 399, 8, 399.0, 8.0, 0.0, 0.0), (2, '2020-05-19', 'Arizona', 4, 14566,
704, None, None, None, None), (3, '2020-05-19', 'Arkansas', 5, 4813, 100, 481
3.0, 100.0, 0.0, 0.0), (4, '2020-05-19', 'California', 6, 82302, 3334, 82302.
0, 3334.0, 0.0, 0.0), (5, '2020-05-19', 'Colorado', 8, 22174, 1224, None, Non
e, None, None), (6, '2020-05-19', 'Connecticut', 9, 38116, 3449, None, None,
None, None), (7, '2020-05-19', 'Delaware', 10, 8037, 304, None, None, None, N
one)  ... displaying 10 of 55 total bound parameter sets ...  (53, '2020-05-1
9', 'Wisconsin', 55, 12763, 459, 12763.0, 459.0, 0.0, 0.0), (54, '2020-05-1
9', 'Wyoming', 56, 766, 10, 577.0, None, 189.0, None))
2020-05-19 17:22:41,956 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,964 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-counties")
2020-05-19 17:22:41,964 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,966 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-counties")
2020-05-19 17:22:41,966 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,968 INFO sqlalchemy.engine.base.Engine SELECT name FROM s
qlite_master WHERE type='table' ORDER BY name
2020-05-19 17:22:41,969 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,970 INFO sqlalchemy.engine.base.Engine PRAGMA main.table_
info("live/us-counties")
2020-05-19 17:22:41,970 INFO sqlalchemy.engine.base.Engine ()
```

```
2020-05-19 17:22:41,972 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-counties' AND type = 'table'
2020-05-19 17:22:41,972 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,973 INFO sqlalchemy.engine.base.Engine PRAGMA main.foreig
n_key_list("live/us-counties")
2020-05-19 17:22:41,974 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,974 INFO sqlalchemy.engine.base.Engine PRAGMA temp.foreig
n_key_list("live/us-counties")
2020-05-19 17:22:41,975 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,976 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-counties' AND type = 'table'
2020-05-19 17:22:41,976 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,977 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us-counties")
2020-05-19 17:22:41,978 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,978 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us-counties_index")
2020-05-19 17:22:41,979 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,980 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
list("live/us-counties")
2020-05-19 17:22:41,980 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,981 INFO sqlalchemy.engine.base.Engine PRAGMA main.index_
info("ix_live/us-counties_index")
2020-05-19 17:22:41,982 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,983 INFO sqlalchemy.engine.base.Engine SELECT sql FROM
(SELECT * FROM sqlite_master UNION ALL   SELECT * FROM sqlite_temp_master) WH
ERE name = 'live/us-counties' AND type = 'table'
2020-05-19 17:22:41,983 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,985 INFO sqlalchemy.engine.base.Engine
DROP TABLE "live/us-counties"
2020-05-19 17:22:41,985 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:41,994 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:41,996 INFO sqlalchemy.engine.base.Engine
CREATE TABLE "live/us-counties" (
        "index" BIGINT,
        date TEXT,
        county TEXT,
        state TEXT,
        fips FLOAT,
        cases BIGINT,
        deaths FLOAT,
        confirmed_cases FLOAT,
        confirmed_deaths FLOAT,
        probable_cases FLOAT,
        probable_deaths FLOAT
)


2020-05-19 17:22:41,997 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:42,002 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:42,003 INFO sqlalchemy.engine.base.Engine CREATE INDEX "ix_l
ive/us-counties_index" ON "live/us-counties" ("index")
2020-05-19 17:22:42,003 INFO sqlalchemy.engine.base.Engine ()
2020-05-19 17:22:42,008 INFO sqlalchemy.engine.base.Engine COMMIT
2020-05-19 17:22:42,012 INFO sqlalchemy.engine.base.Engine BEGIN (implicit)
```

```
2020-05-19 17:22:42,038 INFO sqlalchemy.engine.base.Engine INSERT INTO "live/
us-counties" ("index", date, county, state, fips, cases, deaths, confirmed_ca
ses, confirmed_deaths, probable_cases, probable_deaths) VALUES (?, ?, ?, ?,
?, ?, ?, ?, ?, ?, ?)
2020-05-19 17:22:42,039 INFO sqlalchemy.engine.base.Engine ((0, '2020-05-19',
'Autauga', 'Alabama', 1001.0, 127, 4.0, 127.0, None, None, None), (1, '2020-0
5-19', 'Baldwin', 'Alabama', 1003.0, 262, 8.0, 262.0, None, None, None), (2,
'2020-05-19', 'Barbour', 'Alabama', 1005.0, 90, 1.0, 90.0, None, None, None),
(3, '2020-05-19', 'Bibb', 'Alabama', 1007.0, 51, 1.0, 51.0, None, None, Non
e), (4, '2020-05-19', 'Blount', 'Alabama', 1009.0, 47, 1.0, 47.0, None, None,
None), (5, '2020-05-19', 'Bullock', 'Alabama', 1011.0, 52, 1.0, 52.0, None, N
one, None), (6, '2020-05-19', 'Butler', 'Alabama', 1013.0, 295, 10.0, 295.0,
None, None, None), (7, '2020-05-19', 'Calhoun', 'Alabama', 1015.0, 133, 3.0,
133.0, None, None, None)  ... displaying 10 of 3017 total bound parameter set
s ...  (3015, '2020-05-19', 'Uinta', 'Wyoming', 56041.0, 12, 0.0, 8.0, None,
4.0, None), (3016, '2020-05-19', 'Washakie', 'Wyoming', 56043.0, 15, 0.0, 12.
0, None, 3.0, None))
2020-05-19 17:22:42,057 INFO sqlalchemy.engine.base.Engine COMMIT
```

Writing the Dictionary of DataFrames to a PostgreSQL DataBase

In [6]:
```python
# import sqlalchemy
# import psycopg2
#
# from data_collection import data_dict
#
# engine = sqlalchemy.create_engine("postgresql+psycopg2://username:password@localhost:5432/COVID-19")
# con = engine.connect()
#
# print(engine)
#
# for key, value in data_dict.items():
#     value.to_sql(key, engine, if_exists='replace')
```

Exploratory Data Analysis Examples

In [7]:
```python
# Looking for all COVID-19 cases in California
CA_search = "SELECT * FROM 'us-counties' WHERE state LIKE 'California'"
```
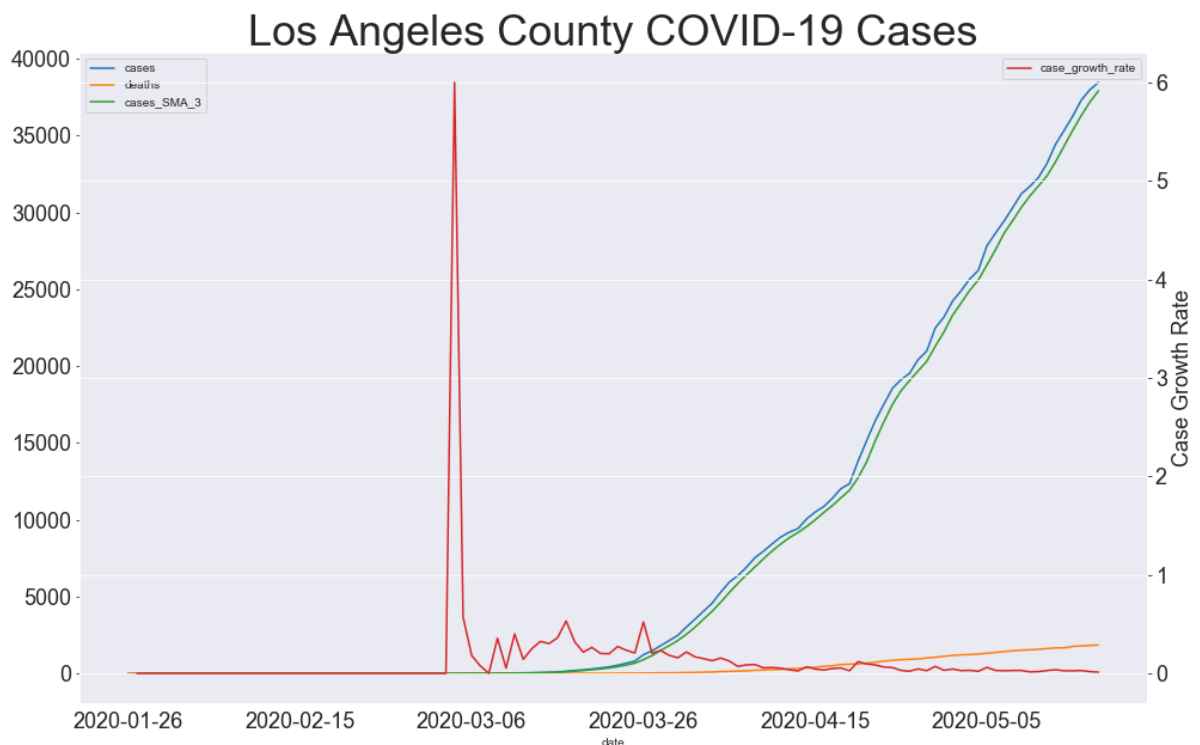
In [8]:
```python
CA = pd.read_sql_query(CA_search, con)
CA
```

```
2020-05-19 17:22:42,080 INFO sqlalchemy.engine.base.Engine SELECT * FROM 'us-
counties' WHERE state LIKE 'California'
2020-05-19 17:22:42,080 INFO sqlalchemy.engine.base.Engine ()
```

Out[8]:

	index	date	county	state	fips	cases	deaths
0	5	2020-01-25	Orange	California	6059.0	1	0
1	9	2020-01-26	Los Angeles	California	6037.0	1	0
2	10	2020-01-26	Orange	California	6059.0	1	0
3	14	2020-01-27	Los Angeles	California	6037.0	1	0
4	15	2020-01-27	Orange	California	6059.0	1	0
...	...	...	...	...	...	...	...
3716	153323	2020-05-18	Tulare	California	6107.0	1436	67
3717	153324	2020-05-18	Tuolumne	California	6109.0	2	0
3718	153325	2020-05-18	Ventura	California	6111.0	838	25
3719	153326	2020-05-18	Yolo	California	6113.0	184	22
3720	153327	2020-05-18	Yuba	California	6115.0	28	1

3721 rows × 7 columns

In [9]:
```python
# Looking for COVID-19 Cases in Los Angeles

los_angeles_query = "SELECT * FROM 'us-counties' WHERE county LIKE 'Los Angele
s'"
los_angeles = pd.read_sql_query(los_angeles_query, con)
los_angeles['cases_SMA_3'] = los_angeles.iloc[:,5].rolling(window=3).mean()
los_angeles['case_growth_rate'] = los_angeles.iloc[:,5].pct_change()

fig = los_angeles.plot(x='date', y=['cases', 'deaths', 'cases_SMA_3'],
                       mark_right=True,
                       kind='line', figsize=(16,10), fontsize=18)

ax = los_angeles['case_growth_rate'].plot(secondary_y='case_growth_rate')
ax.set_ylabel('Case Growth Rate', fontsize=18)
ax.yaxis.set_label_position("right")
ax.yaxis.tick_right()
ax.tick_params(axis="y", labelsize=18)
ax.legend(fontsize=10, loc='best')

plt.title("Los Angeles County COVID-19 Cases", fontsize=36)
plt.xlabel('Date', fontsize=18)
```

```
2020-05-19 17:22:42,141 INFO sqlalchemy.engine.base.Engine SELECT * FROM 'us-
counties' WHERE county LIKE 'Los Angeles'
2020-05-19 17:22:42,141 INFO sqlalchemy.engine.base.Engine ()
```

Out[9]: Text(0.5, 0, 'Date')

In [10]:
```python
# Looking for COVID-19 Cases in Southern California (excluding Los Angeles)

south_cali_query = "SELECT * FROM 'us-counties' WHERE state LIKE 'California'
 and county IN ('Ventura', 'San Bernardino', 'Riverside','Imperial', 'Orange',
'San Diego')"
south_cali = pd.read_sql_query(south_cali_query, con)
south_cali.drop(['index', 'fips'], axis=1, inplace=True)
```
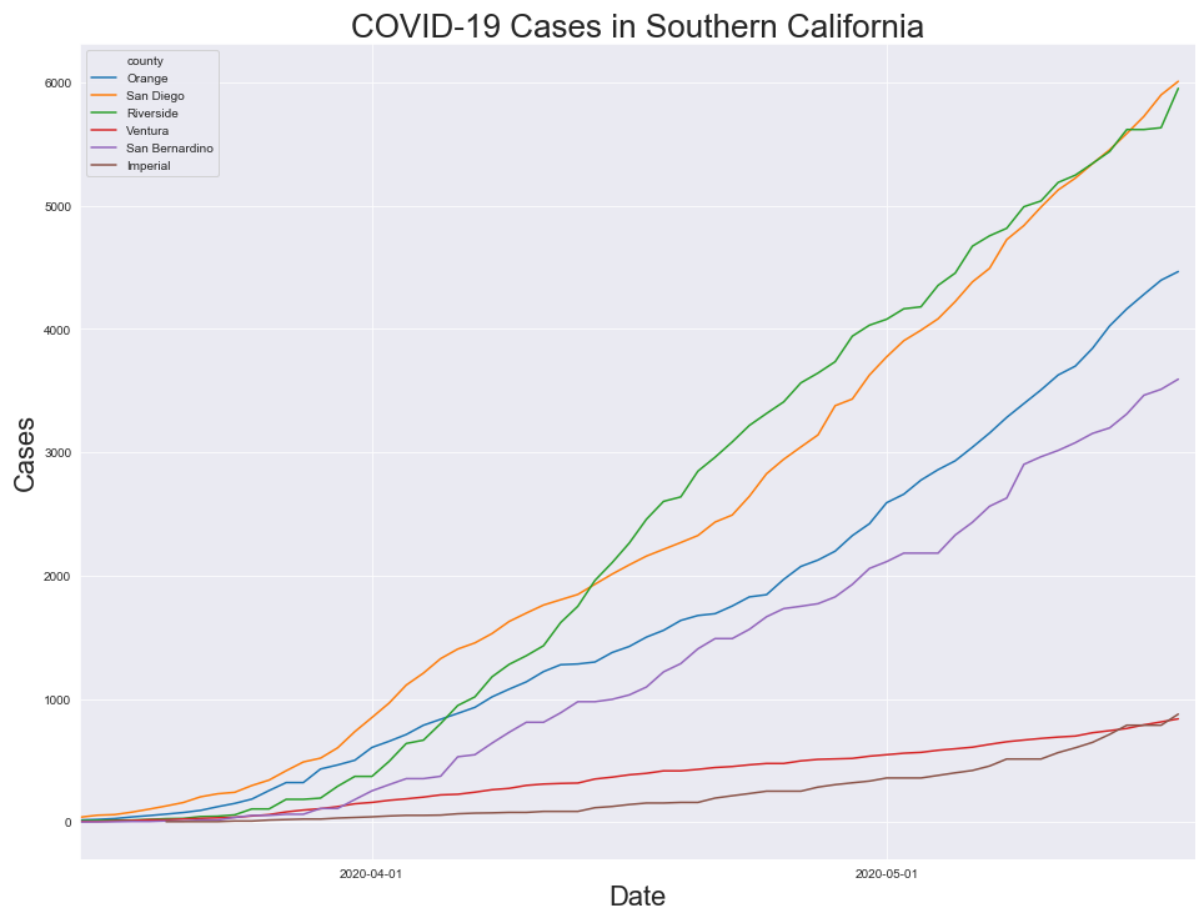
```
2020-05-19 17:22:42,563 INFO sqlalchemy.engine.base.Engine SELECT * FROM 'us-
counties' WHERE state LIKE 'California' and county IN ('Ventura', 'San Bernar
dino', 'Riverside','Imperial', 'Orange', 'San Diego')
2020-05-19 17:22:42,564 INFO sqlalchemy.engine.base.Engine ()
```

In [11]:
```python
import numpy as np

plt.figure(figsize=(16,12))
plt.title("COVID-19 Cases in Southern California", size=26)
ax = sns.lineplot(x="date", y="cases",
                  hue="county", data=south_cali)
ax.set_xlabel('Date', fontsize=22)
ax.set_ylabel('Cases', fontsize=22)
ticks = ['2020-02-01', '2020-03-01', '2020-04-01', '2020-05-01']
ax.set_xticks(ticks=ticks)
ax.set_xlim(left='2020-03-15', right='2020-06-01')
```

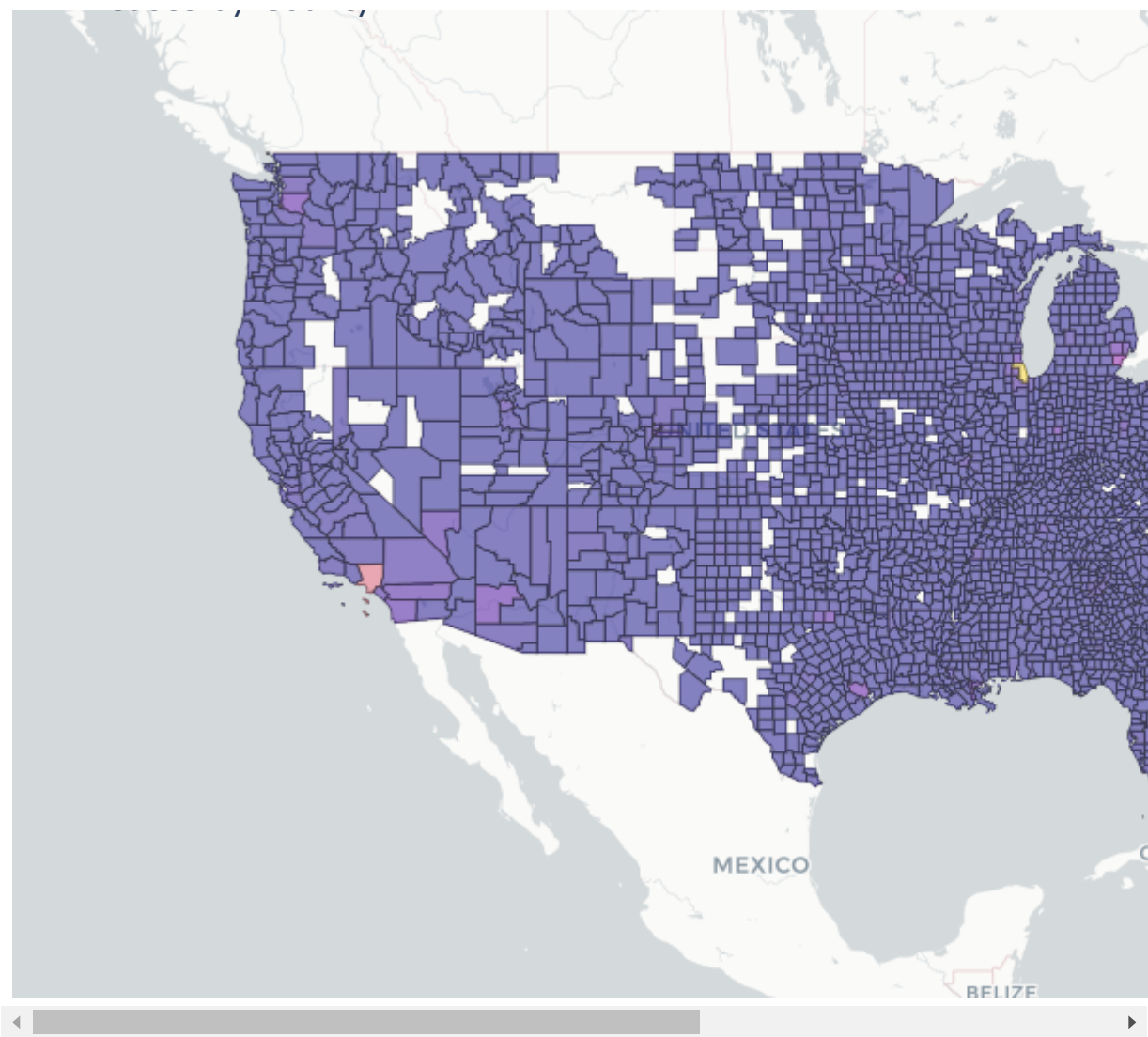Out[11]: (array([50.]), array([115.]))

Plotting Cases by County in the US

In [12]:
```python
from urllib.request import urlopen
import json

with urlopen('https://raw.githubusercontent.com/plotly/datasets/master/geojson
-counties-fips.json') as response:
    counties = json.load(response)

all_US = pd.read_csv("https://raw.githubusercontent.com/nytimes/covid-19-data/
master/us-counties.csv",
                      dtype={"fips": str})

import plotly.express as px

fig = px.choropleth_mapbox(all_US, geojson=counties, locations='fips', color=
'cases',
                           range_color=[0,70000],
                           title='Cases by County',
                           mapbox_style="carto-positron",
                           zoom=3, center={"lat": 37.0902, "lon": -95.7129},
                           opacity=0.5,
                           hover_name='county',
                           labels={'cases': 'cases'}
                           )
fig.update_layout(margin={"r": 0, "t": 0, "l": 0, "b": 0})
fig.show()
```

In [13]:
```python
wayne_query = "SELECT * FROM 'us-counties' WHERE county LIKE 'Wayne' and state
like 'Michigan'"
Wayne = pd.read_sql_query(wayne_query, con)
Wayne['cases_SMA_3'] = Wayne.iloc[:,5].rolling(window=3).mean()
Wayne['case_growth_rate'] = Wayne.iloc[:,5].pct_change()

fig = Wayne.plot(x='date', y=['cases', 'deaths', 'cases_SMA_3'],
                 kind='line', figsize=(20,10), fontsize=18)

ax = Wayne['case_growth_rate'].plot(secondary_y='case_growth_rate')
ax.set_ylabel('Case Growth Rate', fontsize=18)
ax.yaxis.set_label_position("right")
ax.yaxis.tick_right()
ax.tick_params(axis="y", labelsize=18)
ax.legend(fontsize=18, loc='best')

plt.title("Wayne County COVID-19 Cases", fontsize=36)
plt.xlabel('Date', fontsize=18)
```
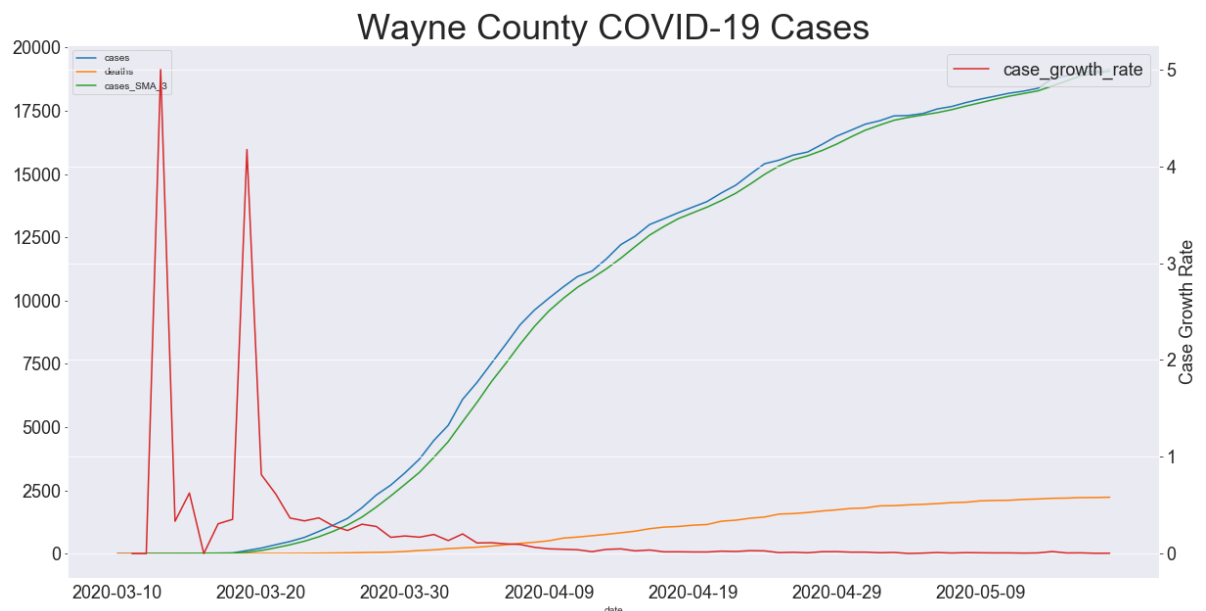
2020-05-19 17:22:52,009 INFO sqlalchemy.engine.base.Engine SELECT * FROM 'us-
counties' WHERE county LIKE 'Wayne' and state like 'Michigan'
2020-05-19 17:22:52,010 INFO sqlalchemy.engine.base.Engine ()

Out[13]: Text(0.5, 0, 'Date')

In [15]:
```python
import seaborn as sns
fmri = sns.load_dataset("fmri")
fmri
```

Out[15]:

	subject	timepoint	event	region	signal
0	s13	18	stim	parietal	-0.017552
1	s5	14	stim	parietal	-0.080883
2	s12	18	stim	parietal	-0.081033
3	s11	18	stim	parietal	-0.046134
4	s10	18	stim	parietal	-0.037970
...	...	...	...	...	...
1059	s0	8	cue	frontal	0.018165
1060	s13	7	cue	frontal	-0.029130
1061	s12	7	cue	frontal	-0.004939
1062	s11	7	cue	frontal	-0.025367
1063	s0	0	cue	parietal	-0.006899

1064 rows × 5 columns