Travels

Where did we travel last years?

The following notebook is a quick excercise with pandas, folium, and matplotlib.

The expected result is a folium map showing the places we have been, grouped by year.

Each year should be represented by a different color.

In [1]:
```python
#importing the needed libraries

import folium
import pandas as pd
import geocoder
import numpy as np
import matplotlib.cm as cm
import matplotlib.colors as colors
```

In [2]:
```python
#g = geocoder.arcgis("Ischigualasto, Argentina")
#lat = g.json['lat']
#lng = g.json['lng']
#print(lat)
#print(lng)
```

In [3]:
```python
#creating a dataframe of all the places.

places_years = (
    ("Santiago, Chile", 2017),
    ("El Quisco, Chile", 2017),

    ("Viña del Mar, Chile", 2018),

    ("San Carlos de Bariloche, Argentina", 2018),
    ("Lago Puelo, Argentina", 2018),
    ("Lago Gutiérrez,Argentina", 2018),
    ("Villa La Angostura,Argentina", 2018),
    ("Villa Traful,Argentina", 2018),
    ("Villa Tacul, Argentina", 2018),
    ("Asociación Camping Musical Bariloche, Argentina, Argentina", 2018),
    ("San Martín de los Andes, Argentina", 2018),
    ("Lago Flakner, Argentina", 2018),
    ("Colonia Suiza, Argentina", 2018),
    ("El Bolsón, Argentina", 2018),

    ("Merlo, Argentina", 2019),
    ("Trapiche, Argentina", 2019),

    ("San Luis, Argentina", 2020),
    ("Las Grutas,Argentina", 2020),
    ("Península de Valdez, Argentina", 2020),
    ("Puerto Madryn, Argentina", 2020),
    ("Lago Futalaufquen, Argentina", 2020),
    ("Lago Menendez, Argentina", 2020),
    ("Lago Rivadavia, Argentina", 2020),
    ("El Bolsón, Argentina", 2020),
    ("San Carlos de Bariloche, Argentina", 2020),
    ("Junín de los Andes, Argentina", 2020),
    ("Lago Huechulafken,Argentina", 2020),
```

```
        ("Chos Malal,Argentina", 2020),
        ("Malargüe,Argentina", 2020),

        ("Neuquén, Argentina", 2021),
        ("Villa Pehuenia, Argentina", 2021),
        ("Lago Aluminé, Argentina", 2021),
        ("Lago Moquehue, Argentina", 2021),
        ("Lago Ñorquinco, Argentina", 2021),
        ("Lago Huechulafquen, Argentina", 2021),
        ("Lago Paimún, Argentina", 2021),
        ("Lago Tromen, Argentina", 2021),
        ("San Martín de los Andes, Argentina", 2021),

        ("La Rioga, Argentina", 2021),
        ("Catamarca, Argentina", 2021),
        ("Tucumán, Argentina", 2021),
        ("Salta, Argentina", 2021),
        ("Cafayate, Argentina", 2021),
        ("Tafí del Valle, Argentina", 2021),
        ("Ischigualasto, Argentina", 2021),
        ("San Juan, Argentina", 2021)


                )
df = pd.DataFrame(places_years)
df.columns=["Place", "Year"]
df
```

Out[3]:

	Place	Year
0	Santiago, Chile	2017
1	El Quisco, Chile	2017
2	Viña del Mar, Chile	2018
3	San Carlos de Bariloche, Argentina	2018
4	Lago Puelo, Argentina	2018
5	Lago Gutiérrez,Argentina	2018
6	Villa La Angostura,Argentina	2018
7	Villa Traful,Argentina	2018
8	Villa Tacul, Argentina	2018
9	Asociación Camping Musical Bariloche, Argentin...	2018
10	San Martín de los Andes, Argentina	2018
11	Lago Flakner, Argentina	2018
12	Colonia Suiza, Argentina	2018
13	El Bolsón, Argentina	2018
14	Merlo, Argentina	2019
15	Trapiche, Argentina	2019
16	San Luis, Argentina	2020
17	Las Grutas,Argentina	2020
18	Península de Valdez, Argentina	2020
19	Puerto Madryn, Argentina	2020
20	Lago Futalaufquen, Argentina	2020

	Place	Year
21	Lago Menendez, Argentina	2020
22	Lago Rivadavia, Argentina	2020
23	El Bolsón, Argentina	2020
24	San Carlos de Bariloche, Argentina	2020
25	Junín de los Andes, Argentina	2020
26	Lago Huechulafken,Argentina	2020
27	Chos Malal,Argentina	2020
28	Malargüe,Argentina	2020
29	Neuquén, Argentina	2021
30	Villa Pehuenia, Argentina	2021
31	Lago Aluminé, Argentina	2021
32	Lago Moquehue, Argentina	2021
33	Lago Ñorquinco, Argentina	2021
34	Lago Huechulafquen, Argentina	2021
35	Lago Paimún, Argentina	2021
36	Lago Tromen, Argentina	2021
37	San Martín de los Andes, Argentina	2021
38	La Rioga, Argentina	2021
39	Catamarca, Argentina	2021
40	Tucumán, Argentina	2021
41	Salta, Argentina	2021
42	Cafayate, Argentina	2021
43	Tafí del Valle, Argentina	2021
44	Ischigualasto, Argentina	2021
45	San Juan, Argentina	2021

In [4]:

```python
#geocoding and listing each lat and long for each place

latitude = list()
longitude = list()
for i in df["Place"]:
    g = geocoder.arcgis("{}".format(i))
    lat = g.json['lat']
    lng = g.json['lng']
    latitude.append(lat)
    longitude.append(lng)
print(latitude)
print(longitude)
```

```
[-33.43721999999997, -33.39842999999996, -33.023909999999944, -41.141569999999945, -42.063
71999999993, -41.20604999999995, -40.76252999999997, -40.65477999999996, -41.0449199999999
34, -41.06370999999996, -40.153719999999964, -40.47555999999997, -41.093669999999975, -41.
956699999999955, -34.66256999999996, -33.094649999999945, -33.30219999999997, -40.80289999
9999966, -42.49999999999994, -42.77076999999997, -42.85854999999998, -42.696369999999945,
```

-42.604799999999955, -41.956699999999955, -41.141569999999945, -39.941659999999956, -39.76
754999999997, -37.373069999999984, -35.476219999999955, -38.951269999999965, -38.879239999
99998, -38.918889999999976, -38.89499999999998, -39.13895999999994, -39.76754999999997, -3
9.713359999999966, -37.09670999999997, -40.153719999999964, -29.413359999999955, -28.48734
9999999935, -26.948193223999965, -24.78863999999993, -26.073039999999935, -26.852509999999
94, -30.082919999999945, -31.533439999999928]
[-70.65001999999998, -71.69841999999994, -71.55216999999993, -71.29963999999995, -71.59897
999999998, -71.41062999999997, -71.64566999999994, -71.39685999999995, -71.57257999999996,
-71.52060999999998, -71.35193999999996, -71.49717999999996, -71.50995999999998, -71.536249
99999994, -58.72709999999995, -65.99324999999993, -66.33758999999998, -65.08128999999997,
-63.99999999999994, -65.04940999999997, -71.60686999999996, -71.80191999999994, -71.664699
99999998, -71.53624999999994, -71.29963999999995, -71.07257999999996, -71.33469999999994,
-70.27328999999997, -69.58525999999995, -68.06073999999995, -71.18650999999994, -71.130069
99999993, -71.26675999999998, -71.28751999999997, -71.33469999999994, -71.57697999999993,
-70.10343999999998, -71.35193999999996, -66.85589999999996, -65.78520999999995, -65.364828
32199994, -65.41022999999996, -65.97540999999995, -65.70324999999997, -67.94557999999995,
-68.51421999999997]

In [5]:
```python
#adding lat and long to our dataframe

df["Latitude"] = latitude
df["Longitude"] = longitude
df
```

Out[5]:

	Place	Year	Latitude	Longitude
0	Santiago, Chile	2017	-33.437220	-70.650020
1	El Quisco, Chile	2017	-33.398430	-71.698420
2	Viña del Mar, Chile	2018	-33.023910	-71.552170
3	San Carlos de Bariloche, Argentina	2018	-41.141570	-71.299640
4	Lago Puelo, Argentina	2018	-42.063720	-71.598980
5	Lago Gutiérrez,Argentina	2018	-41.206050	-71.410630
6	Villa La Angostura,Argentina	2018	-40.762530	-71.645670
7	Villa Traful,Argentina	2018	-40.654780	-71.396860
8	Villa Tacul, Argentina	2018	-41.044920	-71.572580
9	Asociación Camping Musical Bariloche, Argentin...	2018	-41.063710	-71.520610
10	San Martín de los Andes, Argentina	2018	-40.153720	-71.351940
11	Lago Flakner, Argentina	2018	-40.475560	-71.497180
12	Colonia Suiza, Argentina	2018	-41.093670	-71.509960
13	El Bolsón, Argentina	2018	-41.956700	-71.536250
14	Merlo, Argentina	2019	-34.662570	-58.727100
15	Trapiche, Argentina	2019	-33.094650	-65.993250
16	San Luis, Argentina	2020	-33.302200	-66.337590
17	Las Grutas,Argentina	2020	-40.802900	-65.081290
18	Península de Valdez, Argentina	2020	-42.500000	-64.000000
19	Puerto Madryn, Argentina	2020	-42.770770	-65.049410
20	Lago Futalaufquen, Argentina	2020	-42.858550	-71.606870
21	Lago Menendez, Argentina	2020	-42.696370	-71.801920

	Place	Year	Latitude	Longitude
22	Lago Rivadavia, Argentina	2020	-42.604800	-71.664700
23	El Bolsón, Argentina	2020	-41.956700	-71.536250
24	San Carlos de Bariloche, Argentina	2020	-41.141570	-71.299640
25	Junín de los Andes, Argentina	2020	-39.941660	-71.072580
26	Lago Huechulafken,Argentina	2020	-39.767550	-71.334700
27	Chos Malal,Argentina	2020	-37.373070	-70.273290
28	Malargüe,Argentina	2020	-35.476220	-69.585260
29	Neuquén, Argentina	2021	-38.951270	-68.060740
30	Villa Pehuenia, Argentina	2021	-38.879240	-71.186510
31	Lago Aluminé, Argentina	2021	-38.918890	-71.130070
32	Lago Moquehue, Argentina	2021	-38.895000	-71.266760
33	Lago Ñorquinco, Argentina	2021	-39.138960	-71.287520
34	Lago Huechulafquen, Argentina	2021	-39.767550	-71.334700
35	Lago Paimún, Argentina	2021	-39.713360	-71.576980
36	Lago Tromen, Argentina	2021	-37.096710	-70.103440
37	San Martín de los Andes, Argentina	2021	-40.153720	-71.351940
38	La Rioga, Argentina	2021	-29.413360	-66.855900
39	Catamarca, Argentina	2021	-28.487350	-65.785210
40	Tucumán, Argentina	2021	-26.948193	-65.364828
41	Salta, Argentina	2021	-24.788640	-65.410230
42	Cafayate, Argentina	2021	-26.073040	-65.975410
43	Tafí del Valle, Argentina	2021	-26.852510	-65.703250
44	Ischigualasto, Argentina	2021	-30.082920	-67.945580
45	San Juan, Argentina	2021	-31.533440	-68.514220

In [6]:
```python
df_copy = df
```

In [7]:
```python
#manually correcting the geocoder

df.at[14,"Latitude"] = -32.34751
df.at[14,"Longitude"] = -65.01590
df
```

Out[7]:
	Place	Year	Latitude	Longitude
0	Santiago, Chile	2017	-33.437220	-70.650020
1	El Quisco, Chile	2017	-33.398430	-71.698420
2	Viña del Mar, Chile	2018	-33.023910	-71.552170
3	San Carlos de Bariloche, Argentina	2018	-41.141570	-71.299640

	Place	Year	Latitude	Longitude
4	Lago Puelo, Argentina	2018	-42.063720	-71.598980
5	Lago Gutiérrez,Argentina	2018	-41.206050	-71.410630
6	Villa La Angostura,Argentina	2018	-40.762530	-71.645670
7	Villa Traful,Argentina	2018	-40.654780	-71.396860
8	Villa Tacul, Argentina	2018	-41.044920	-71.572580
9	Asociación Camping Musical Bariloche, Argentin...	2018	-41.063710	-71.520610
10	San Martín de los Andes, Argentina	2018	-40.153720	-71.351940
11	Lago Flakner, Argentina	2018	-40.475560	-71.497180
12	Colonia Suiza, Argentina	2018	-41.093670	-71.509960
13	El Bolsón, Argentina	2018	-41.956700	-71.536250
14	Merlo, Argentina	2019	-32.347510	-65.015900
15	Trapiche, Argentina	2019	-33.094650	-65.993250
16	San Luis, Argentina	2020	-33.302200	-66.337590
17	Las Grutas,Argentina	2020	-40.802900	-65.081290
18	Península de Valdez, Argentina	2020	-42.500000	-64.000000
19	Puerto Madryn, Argentina	2020	-42.770770	-65.049410
20	Lago Futalaufquen, Argentina	2020	-42.858550	-71.606870
21	Lago Menendez, Argentina	2020	-42.696370	-71.801920
22	Lago Rivadavia, Argentina	2020	-42.604800	-71.664700
23	El Bolsón, Argentina	2020	-41.956700	-71.536250
24	San Carlos de Bariloche, Argentina	2020	-41.141570	-71.299640
25	Junín de los Andes, Argentina	2020	-39.941660	-71.072580
26	Lago Huechulafken,Argentina	2020	-39.767550	-71.334700
27	Chos Malal,Argentina	2020	-37.373070	-70.273290
28	Malargüe,Argentina	2020	-35.476220	-69.585260
29	Neuquén, Argentina	2021	-38.951270	-68.060740
30	Villa Pehuenia, Argentina	2021	-38.879240	-71.186510
31	Lago Aluminé, Argentina	2021	-38.918890	-71.130070
32	Lago Moquehue, Argentina	2021	-38.895000	-71.266760
33	Lago Ñorquinco, Argentina	2021	-39.138960	-71.287520
34	Lago Huechulafquen, Argentina	2021	-39.767550	-71.334700
35	Lago Paimún, Argentina	2021	-39.713360	-71.576980
36	Lago Tromen, Argentina	2021	-37.096710	-70.103440
37	San Martín de los Andes, Argentina	2021	-40.153720	-71.351940
38	La Rioga, Argentina	2021	-29.413360	-66.855900
39	Catamarca, Argentina	2021	-28.487350	-65.785210

	Place	Year	Latitude	Longitude
40	Tucumán, Argentina	2021	-26.948193	-65.364828
41	Salta, Argentina	2021	-24.788640	-65.410230
42	Cafayate, Argentina	2021	-26.073040	-65.975410
43	Tafí del Valle, Argentina	2021	-26.852510	-65.703250
44	Ischigualasto, Argentina	2021	-30.082920	-67.945580
45	San Juan, Argentina	2021	-31.533440	-68.514220

In [8]:
```python
# creating the map

arg = geocoder.arcgis("Argentina")
m = folium.Map(location = (arg.lat, arg.lng), zoom_start = 4.5)
for lat, lng, label, year in zip(df['Latitude'], df['Longitude'], df['Place'], df["Year"])
    label = folium.Popup(label + ' '+str(year), parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.7,
        parse_html=False).add_to(m)
m
```

Out[8]:
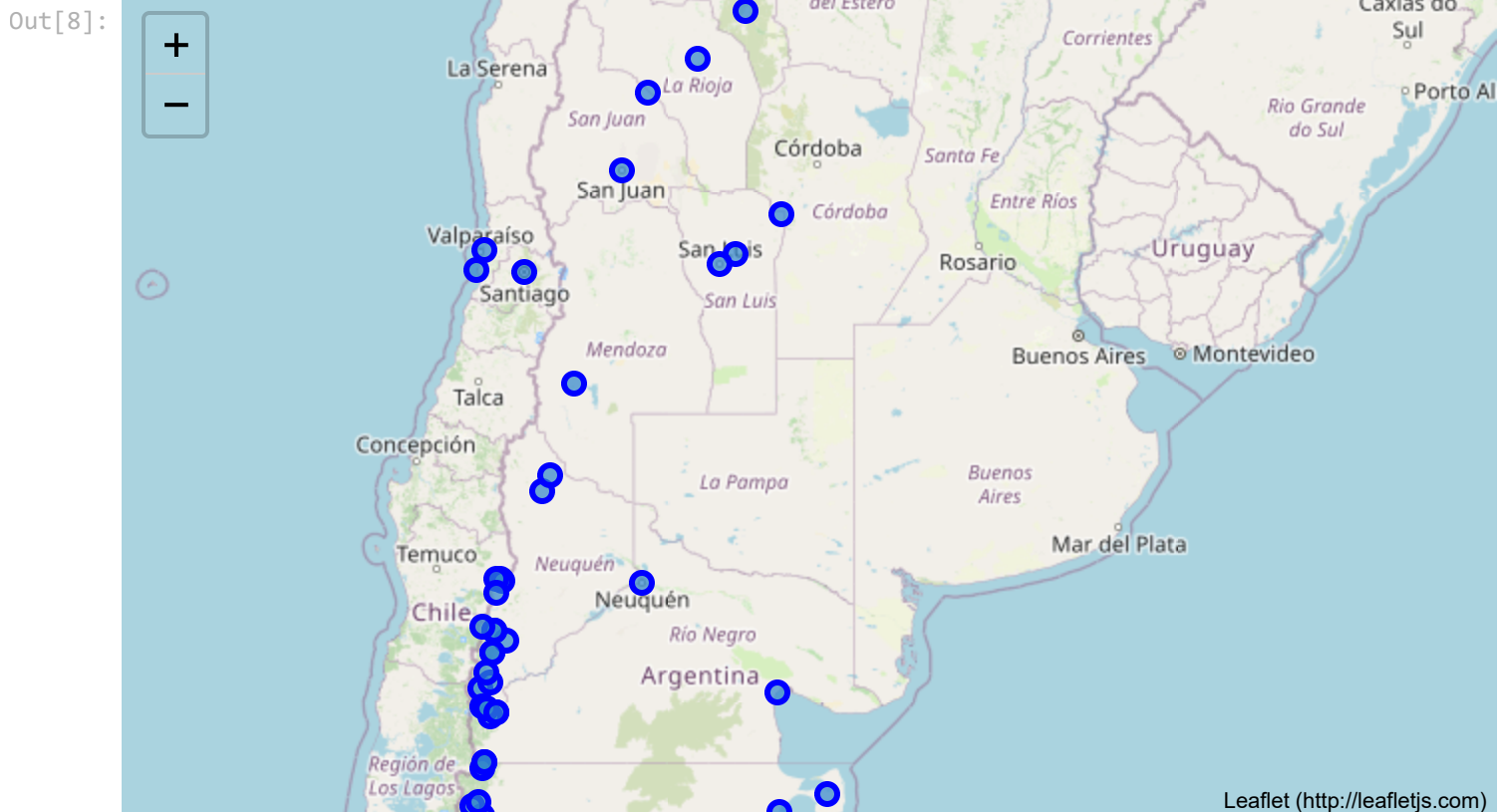
In [9]:
```python
#creating the map with the colors

arg = geocoder.arcgis("Argentina")
m = folium.Map(location = (arg.lat, arg.lng), zoom_start = 4.5)

years = pd.unique(df["Year"])
```

```
x = np.arange(len(years))
ys = [i + x + (i*x)**2 for i in range(len(years))]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

for lat, lng, label, year, in zip(df['Latitude'], df['Longitude'], df['Place'], df["Year"]
    label = folium.Popup(label + ' '+str(year), parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color=rainbow[year-2017],
        fill=True,
        fill_color=rainbow[year-2017],
        fill_opacity=0.7,
        parse_html=False).add_to(m)
m
```

Out[9]:
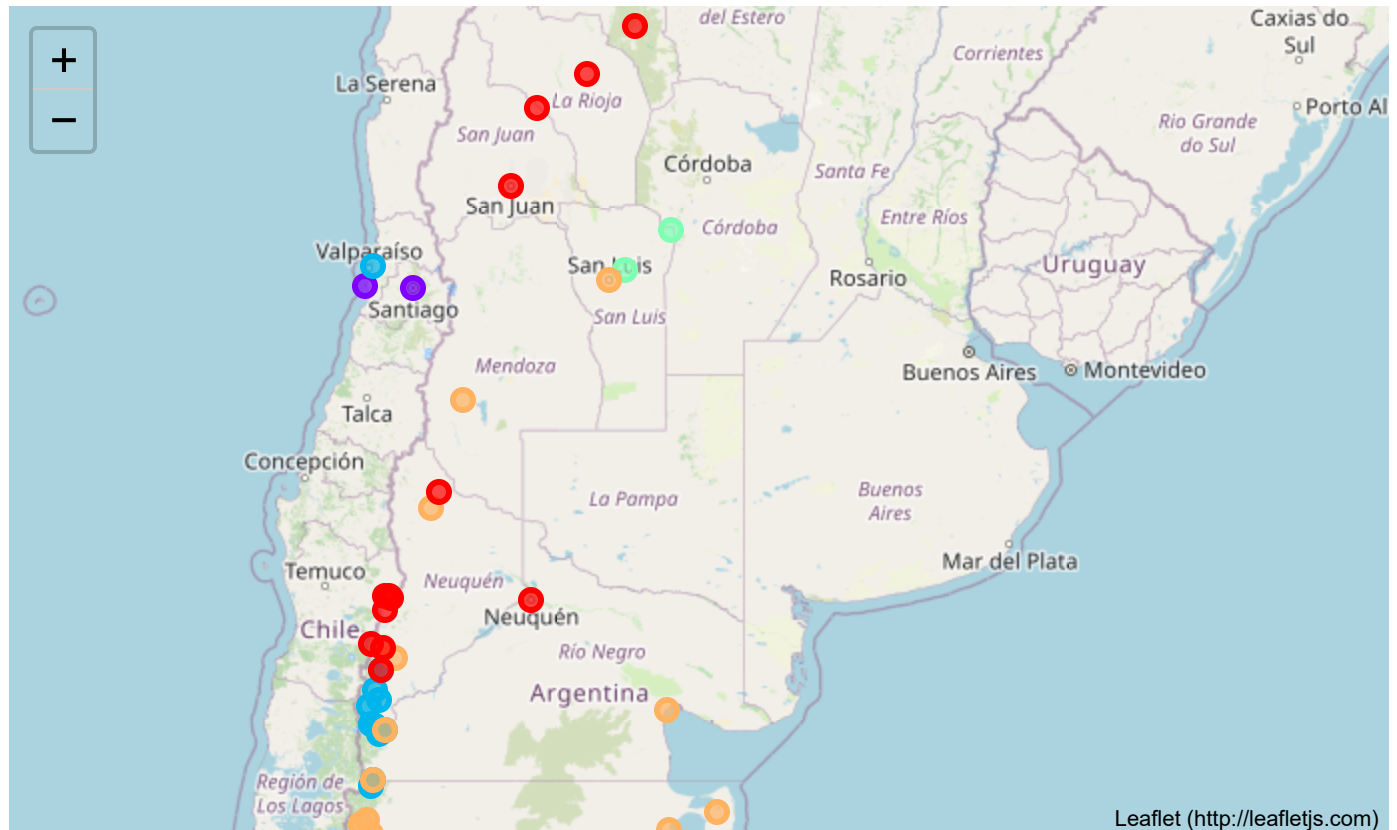
Map showing the places grouped by colors was made.