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

Out[2]:

	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
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

	Place	Year
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

In [13]:
```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.
95670999999993, -34.66256999999996, -33.094649999999945, -33.30219999999997, -40.802899999
999966, -42.49999999999994, -42.77076999999997, -42.85854999999998, -42.696369999999945, -
42.604799999999955, -41.95670999999993, -41.141569999999945, -39.941659999999956, -39.7675
49999999997, -37.373069999999984, -35.476219999999955, -38.951269999999965, -38.87923999999
998, -38.918889999999976, -38.89499999999998, -39.13895999999994, -39.76754999999997, -39.
71335999999966, -37.09670999999997, -40.153719999999964]
[-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, -71.536309
99999996, -58.72709999999995, -65.99324999999993, -66.33758999999998, -65.08128999999997,
-63.99999999999994, -65.04940999999997, -71.60686999999996, -71.80191999999994, -71.664699
99999998, -71.53630999999996, -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]
```

In [14]:
```python
#adding lat and long to our dataframe

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

Out[14]:
	Place	Year	Latitude	Longitude
0	Santiago, Chile	2017	-33.43722	-70.65002
1	El Quisco, Chile	2017	-33.39843	-71.69842
2	Viña del Mar, Chile	2018	-33.02391	-71.55217
3	San Carlos de Bariloche, Argentina	2018	-41.14157	-71.29964
4	Lago Puelo, Argentina	2018	-42.06372	-71.59898

	Place	Year	Latitude	Longitude
5	Lago Gutiérrez,Argentina	2018	-41.20605	-71.41063
6	Villa La Angostura,Argentina	2018	-40.76253	-71.64567
7	Villa Traful,Argentina	2018	-40.65478	-71.39686
8	Villa Tacul, Argentina	2018	-41.04492	-71.57258
9	Asociación Camping Musical Bariloche, Argentin...	2018	-41.06371	-71.52061
10	San Martín de los Andes, Argentina	2018	-40.15372	-71.35194
11	Lago Flakner, Argentina	2018	-40.47556	-71.49718
12	Colonia Suiza, Argentina	2018	-41.09367	-71.50996
13	El Bolsón, Argentina	2018	-41.95671	-71.53631
14	Merlo, Argentina	2019	-34.66257	-58.72710
15	Trapiche, Argentina	2019	-33.09465	-65.99325
16	San Luis, Argentina	2020	-33.30220	-66.33759
17	Las Grutas,Argentina	2020	-40.80290	-65.08129
18	Península de Valdez, Argentina	2020	-42.50000	-64.00000
19	Puerto Madryn, Argentina	2020	-42.77077	-65.04941
20	Lago Futalaufquen, Argentina	2020	-42.85855	-71.60687
21	Lago Menendez, Argentina	2020	-42.69637	-71.80192
22	Lago Rivadavia, Argentina	2020	-42.60480	-71.66470
23	El Bolsón, Argentina	2020	-41.95671	-71.53631
24	San Carlos de Bariloche, Argentina	2020	-41.14157	-71.29964
25	Junín de los Andes, Argentina	2020	-39.94166	-71.07258
26	Lago Huechulafken,Argentina	2020	-39.76755	-71.33470
27	Chos Malal,Argentina	2020	-37.37307	-70.27329
28	Malargüe,Argentina	2020	-35.47622	-69.58526
29	Neuquén, Argentina	2021	-38.95127	-68.06074
30	Villa Pehuenia, Argentina	2021	-38.87924	-71.18651
31	Lago Aluminé, Argentina	2021	-38.91889	-71.13007
32	Lago Moquehue, Argentina	2021	-38.89500	-71.26676
33	Lago Ñorquinco, Argentina	2021	-39.13896	-71.28752
34	Lago Huechulafquen, Argentina	2021	-39.76755	-71.33470
35	Lago Paimún, Argentina	2021	-39.71336	-71.57698
36	Lago Tromen, Argentina	2021	-37.09671	-70.10344
37	San Martín de los Andes, Argentina	2021	-40.15372	-71.35194

In [15]:
```python
df_copy = df
```

In [16]:

```
#manually correcting the geocoder

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

Out[16]:

	Place	Year	Latitude	Longitude
0	Santiago, Chile	2017	-33.43722	-70.65002
1	El Quisco, Chile	2017	-33.39843	-71.69842
2	Viña del Mar, Chile	2018	-33.02391	-71.55217
3	San Carlos de Bariloche, Argentina	2018	-41.14157	-71.29964
4	Lago Puelo, Argentina	2018	-42.06372	-71.59898
5	Lago Gutiérrez,Argentina	2018	-41.20605	-71.41063
6	Villa La Angostura,Argentina	2018	-40.76253	-71.64567
7	Villa Traful,Argentina	2018	-40.65478	-71.39686
8	Villa Tacul, Argentina	2018	-41.04492	-71.57258
9	Asociación Camping Musical Bariloche, Argentin...	2018	-41.06371	-71.52061
10	San Martín de los Andes, Argentina	2018	-40.15372	-71.35194
11	Lago Flakner, Argentina	2018	-40.47556	-71.49718
12	Colonia Suiza, Argentina	2018	-41.09367	-71.50996
13	El Bolsón, Argentina	2018	-41.95671	-71.53631
14	Merlo, Argentina	2019	-32.34751	-65.01590
15	Trapiche, Argentina	2019	-33.09465	-65.99325
16	San Luis, Argentina	2020	-33.30220	-66.33759
17	Las Grutas,Argentina	2020	-40.80290	-65.08129
18	Península de Valdez, Argentina	2020	-42.50000	-64.00000
19	Puerto Madryn, Argentina	2020	-42.77077	-65.04941
20	Lago Futalaufquen, Argentina	2020	-42.85855	-71.60687
21	Lago Menendez, Argentina	2020	-42.69637	-71.80192
22	Lago Rivadavia, Argentina	2020	-42.60480	-71.66470
23	El Bolsón, Argentina	2020	-41.95671	-71.53631
24	San Carlos de Bariloche, Argentina	2020	-41.14157	-71.29964
25	Junín de los Andes, Argentina	2020	-39.94166	-71.07258
26	Lago Huechulafken,Argentina	2020	-39.76755	-71.33470
27	Chos Malal,Argentina	2020	-37.37307	-70.27329
28	Malargüe,Argentina	2020	-35.47622	-69.58526
29	Neuquén, Argentina	2021	-38.95127	-68.06074
30	Villa Pehuenia, Argentina	2021	-38.87924	-71.18651
31	Lago Aluminé, Argentina	2021	-38.91889	-71.13007
32	Lago Moquehue, Argentina	2021	-38.89500	-71.26676

	Place	Year	Latitude	Longitude
33	Lago Ñorquinco, Argentina	2021	-39.13896	-71.28752
34	Lago Huechulafquen, Argentina	2021	-39.76755	-71.33470
35	Lago Paimún, Argentina	2021	-39.71336	-71.57698
36	Lago Tromen, Argentina	2021	-37.09671	-70.10344
37	San Martín de los Andes, Argentina	2021	-40.15372	-71.35194

In [17]:
```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[17]:
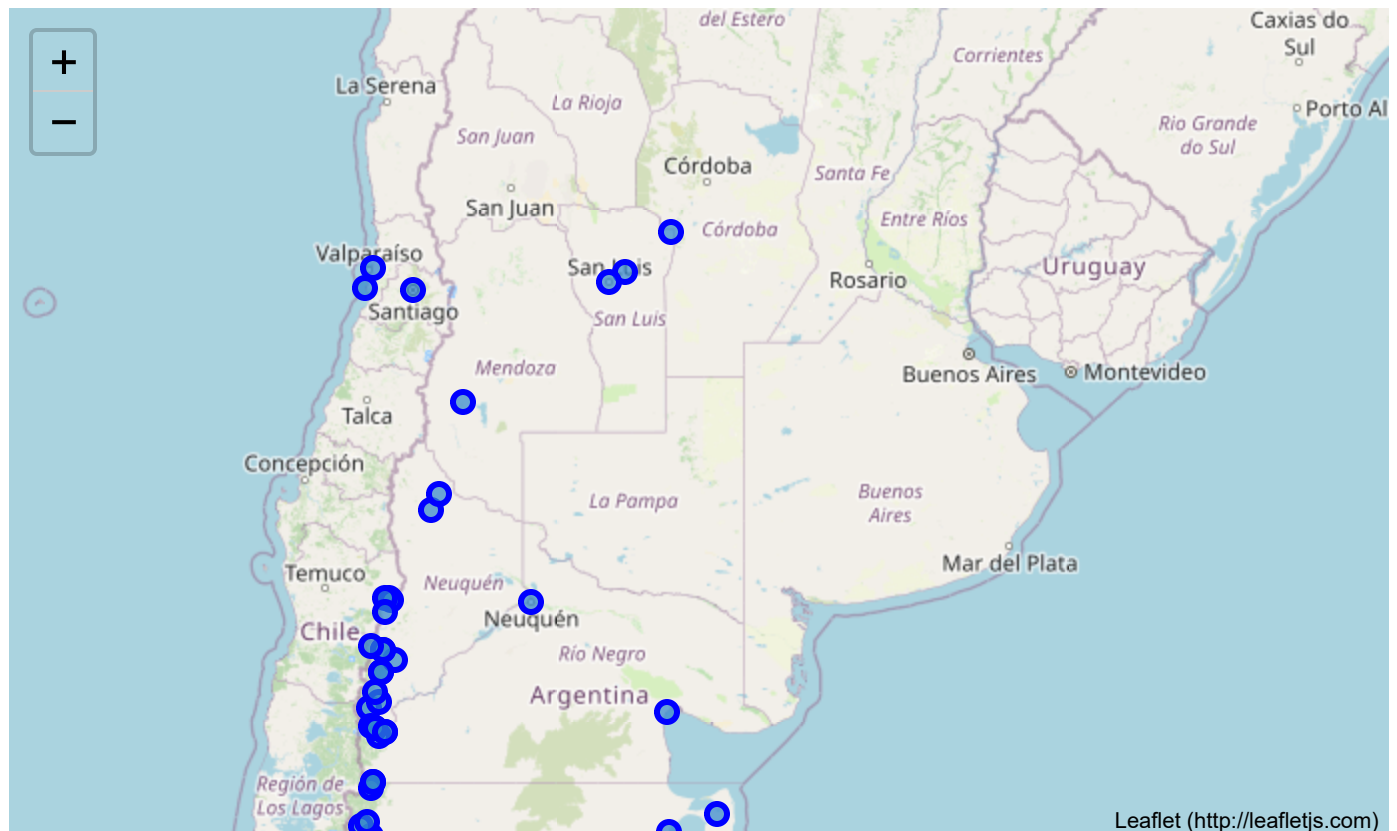
In [18]:
```python
#creating the map with the colors

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[18]:
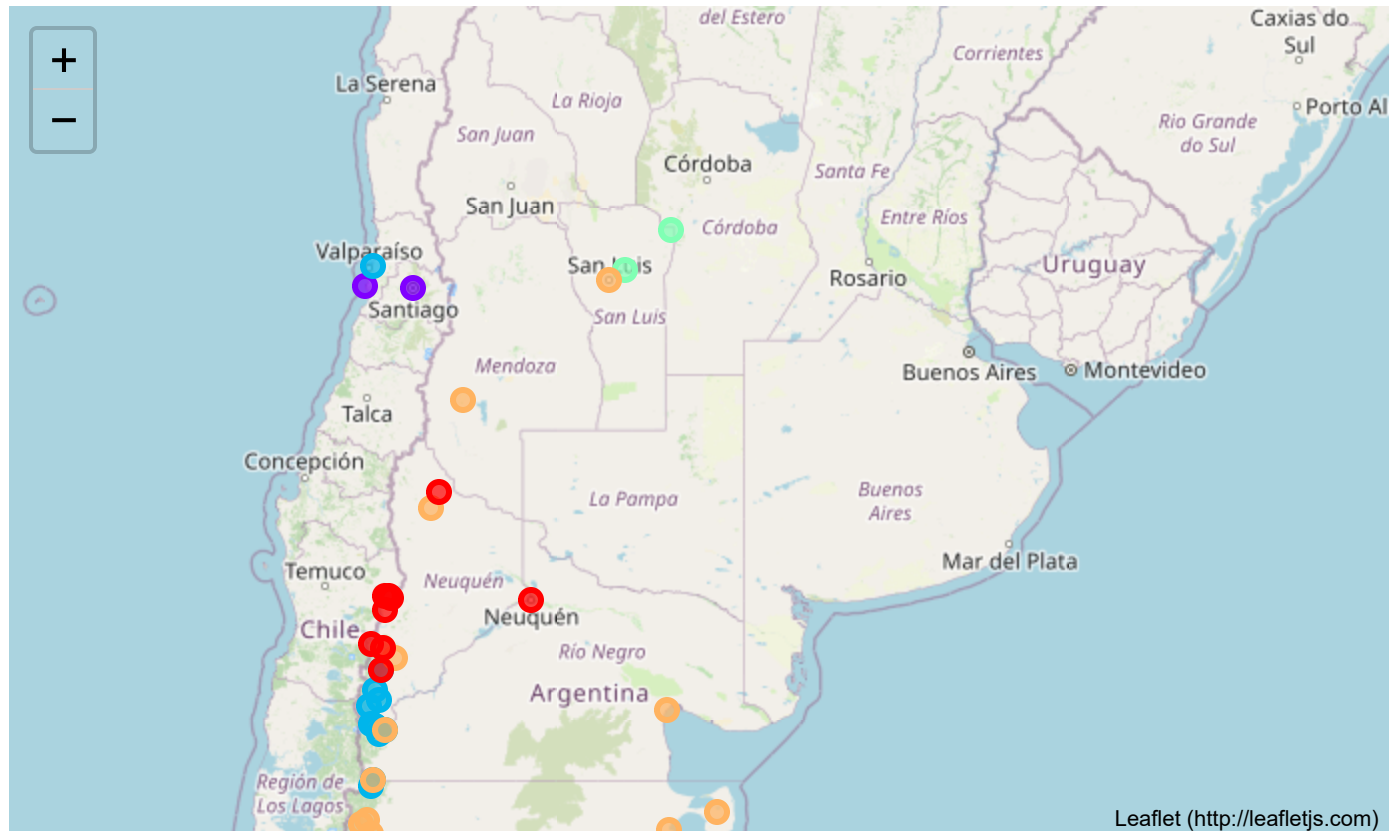
Map showing the places grouped by colors was made.