In [1]:
```
import pandas as pd
import plotly.express as px
import numpy as np
%config IPCompleter.greedy=True

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)
```

3. Load election_context-2018.csv and use Plotly to create the following maps. Each map must have a title and legend.

In [2]:
```
election = pd.read_csv('election-context-2018.csv')
election.head(2)
```

Out[2]:

	state	county	fips	trump16	clinton16	otherpres16	romney12	obama12	otherpres12	demsen16	...
0	Alabama	Autauga	1001	18172	5936	865	17379	6363	190	6331.0	...
1	Alabama	Baldwin	1003	72883	18458	3874	66016	18424	898	19145.0	...

2 rows × 39 columns

a. (Figure 1) A Choropleth map showing the 2016 county by county senate election results in the state of Georgia. The map should show the map of Georgia and only Georgia.

i. For each county, compare the columns “demsen16”, “repsen16”, and “othersen16”. If “demsen16” has the highest number, color the county blue in the map. If “repsen16” has the highest number, color the county red in the map. If “othersen16” has the highest number, color the county white in the map. ii. The border of each county should be black.

In [3]:
```
Georgia = election['state'].isin(['Georgia'])
```

In [4]:
```
Georgia = election[Georgia]
```

In [5]:
```
Georgia.head(2)
```

Out[5]:

	state	county	fips	trump16	clinton16	otherpres16	romney12	obama12	otherpres12	demsen16	.
358	Georgia	Appling	13001	5494	1434	84	5233	1758	95	1187.0	.
359	Georgia	Atkinson	13003	1878	697	35	1938	930	34	596.0	.

2 rows × 39 columns

In [6]:
```
Georgia['winner'] = np.where(Georgia['demsen16']>Georgia['repsen16'],
                                                'demsen16', 'repsen16')
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:2: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [7]:
```
Georgia.head(2)
```

Out[7]:

	state	county	fips	trump16	clinton16	otherpres16	romney12	obama12	otherpres12	demsen16	.
358	Georgia	Appling	13001	5494	1434	84	5233	1758	95	1187.0	.
359	Georgia	Atkinson	13003	1878	697	35	1938	930	34	596.0	.

2 rows × 40 columns

In [8]:
```
demsen16 = Georgia['winner'].isin(['demsen16'])
demsen16 = Georgia[demsen16]
demsen16['winner'] = np.where(demsen16['demsen16']>demsen16['othersen16'], 'demsen1
6','othersen16')
demsen16
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

Out[8]:

	state	county	fips	trump16	clinton16	otherpres16	romney12	obama12	otherpres12	demsen16
368	Georgia	Bibb	13021	24043	36787	1766	25623	38585	510	31533.0
376	Georgia	Calhoun	13037	830	1179	16	883	1298	7	1007.0
382	Georgia	Chatham	13051	45688	62290	4164	47204	60246	1178	52146.0
386	Georgia	Clarke	13059	12717	29603	2656	13815	25431	1122	25474.0
387	Georgia	Clay	13061	566	697	10	537	862	3	574.0
388	Georgia	Clayton	13063	12645	78220	1994	14164	81479	424	69400.0
401	Georgia	DeKalb	13089	51468	251370	11919	64392	238224	3649	218383.0
404	Georgia	Dougherty	13095	10232	23311	544	11449	26295	175	20354.0
405	Georgia	Douglas	13097	24817	31005	1916	26241	28441	585	28166.0
417	Georgia	Fulton	13121	117783	297051	16557	137124	255470	4819	246397.0
427	Georgia	Hancock	13141	843	2701	36	769	3308	11	2295.0
438	Georgia	Jefferson	13163	3063	3821	84	2999	4261	38	3091.0
446	Georgia	Liberty	13179	6134	9556	453	5565	10457	148	8147.0
453	Georgia	Macon	13193	1540	2705	42	1545	3211	25	2129.0
463	Georgia	Muscogee	13215	26976	39851	2205	27510	42573	520	33620.0
478	Georgia	Richmond	13245	24461	48814	2240	25845	52560	615	42229.0
479	Georgia	Rockdale	13247	13478	23255	1136	15716	22023	346	21223.0
485	Georgia	Stewart	13259	805	1222	31	745	1323	8	900.0
487	Georgia	Talbot	13263	1196	2002	48	1202	2265	24	1639.0
488	Georgia	Taliaferro	13265	349	545	3	323	636	4	443.0
506	Georgia	Warren	13301	991	1314	29	990	1529	7	1110.0

21 rows × 40 columns

In [9]:
```
repsen16 = Georgia['winner'].isin(['repsen16'])
repsen16 = Georgia[repsen16]
repsen16['winner'] = np.where(repsen16['repsen16']>repsen16['othersen16'], 'repsen16','othersen16')
repsen16
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```

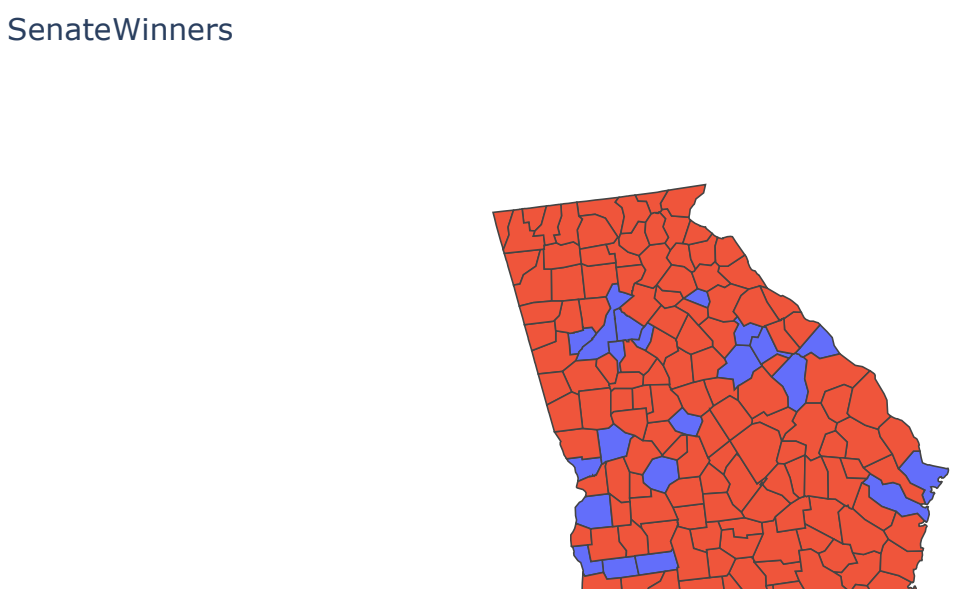
Out[9]:

	state	county	fips	trump16	clinton16	otherpres16	romney12	obama12	otherpres12	demsen16
358	Georgia	Appling	13001	5494	1434	84	5233	1758	95	1187.0
359	Georgia	Atkinson	13003	1878	697	35	1938	930	34	596.0
360	Georgia	Bacon	13005	3364	608	48	3093	791	47	474.0
361	Georgia	Baker	13007	775	650	15	785	794	10	531.0
362	Georgia	Baldwin	13009	7697	7970	449	7589	8483	166	6787.0
...	...	...	...	...	...	...	...	...	...	...
512	Georgia	Whitfield	13313	21537	7937	1184	19305	7210	361	6763.0
513	Georgia	Wilcox	13315	2096	852	28	2053	1060	16	669.0
514	Georgia	Wilkes	13317	2572	1848	66	2635	2087	39	1525.0
515	Georgia	Wilkinson	13319	2333	1894	60	2246	2181	23	1616.0
516	Georgia	Worth	13321	6152	2020	123	5869	2487	63	1839.0

138 rows × 40 columns

In [10]:
```
Georgia = demsen16.merge(repsen16, how='outer')
```

In [11]:
```
fips = Georgia['fips'].tolist()
gElec = px.choropleth(Georgia, geojson = counties, locations = fips, scope = 'usa',
color = 'winner', title = 'SenateWinners')
gElec.update_geos(fitbounds="locations", visible=False)
gElec.show()
```



(Figure 2) Create a similar Choropleth map showing the 2016 county by county house election results in the state of Georgia, using the same color scheme as specified above.

In [12]:
```
Georgia['houseWinner'] = np.where(Georgia['demhouse16']>Georgia['rephouse16'],
                                  'demhouse16', 'rephouse16')
```

In [13]:
```
demhouse16 = Georgia['houseWinner'].isin(['demhouse16'])
demhouse16 = Georgia[demhouse16]
demhouse16['winner'] = np.where(demhouse16['demhouse16']>demhouse16['otherhouse16
'], 'demhouse16','otherhouse16')
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

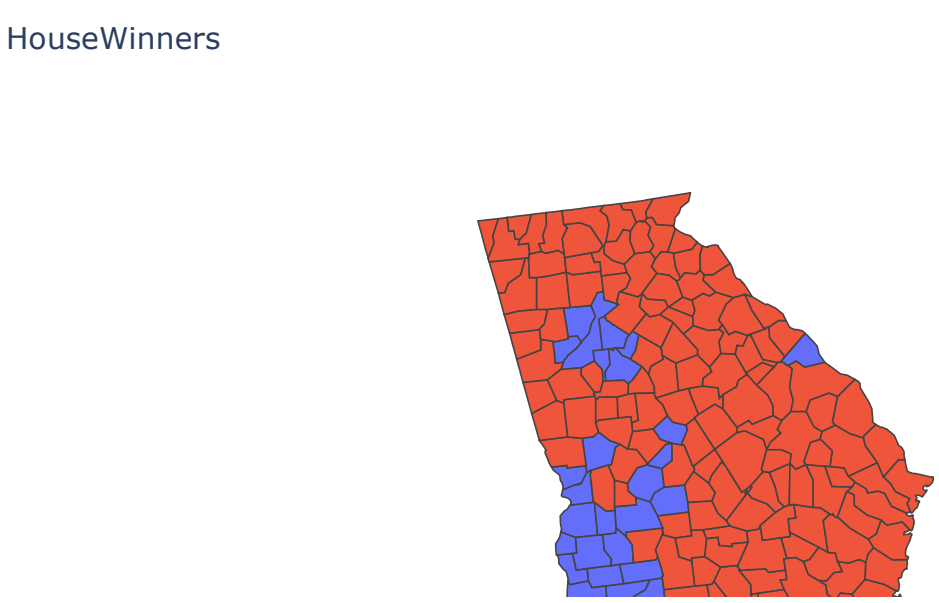
In [14]:
```
rephouse16 = Georgia['houseWinner'].isin(['rephouse16'])
rephouse16 = Georgia[rephouse16]
rephouse16['winner'] = np.where(rephouse16['rephouse16']>rephouse16['otherhouse16
'], 'rephouse16','otherhouse16')
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [15]:
```
Georgia = demhouse16.merge(rephouse16, how='outer')
fips = Georgia['fips'].tolist()
gElecHouse = px.choropleth(Georgia, geojson = counties, locations = fips, scope = '
usa', color = 'winner', title = 'HouseWinners')
gElecHouse.update_geos(fitbounds="locations", visible=False)
gElecHouse.show()
```



4. Load 1976-2018-senate.csv and use Plotly to create the following map. Every figure must have a title and a legend.

In [16]:
```
senate = pd.read_csv('1976-2018-senate.csv', encoding= 'unicode_escape')
```

In [17]:
```
senate.head(2)
```

Out[17]:

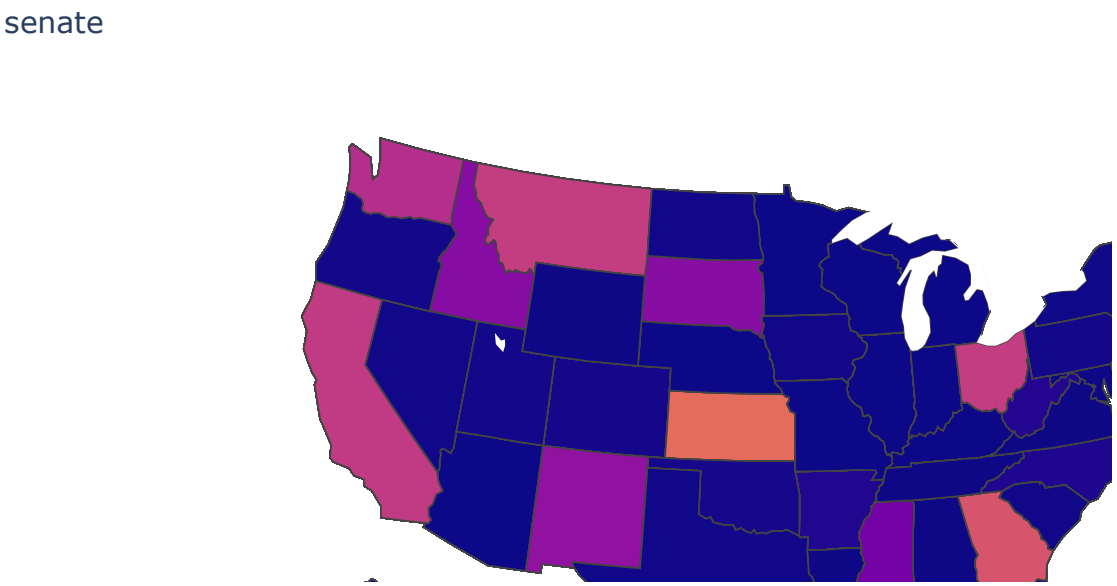
	year	state	state_po	state_fips	state_cen	state_ic	office	district	stage	special	candidate	p
0	1976	Arizona	AZ	4	86	61	US Senate	statewide	gen	False	Sam Steiger	republ
1	1976	Arizona	AZ	4	86	61	US Senate	statewide	gen	False	Wm. Mathews Feighan	indepen

a. (Figure 3) Create a Choropleth map for the 2018 US senate election. The map should show the entire United States. Each state should be color coded. The value for each state is the winning candidate's vote percentage. Divide the vote percentage into 6 bins and create a color scale for it.

When the mouse cursor hovers over each state, the winning candidate's name and party affiliation should be displayed in the tooltip window. For example, Wyoming's 2018 winning candidate was John Barrasso, Republican. His vote percentage was 136210/203420.

In [18]:
```
senate['votePer']= senate['candidatevotes']/senate['totalvotes']
```

In [19]:
```
fips = senate['state_fips'].tolist()
gSen = px.choropleth(senate, locations = 'state_po', locationmode = 'USA-states', t
itle = 'senate', scope = 'usa', color = 'votePer', color_continuous_scale = px.colo
rs.sequential.Plasma, hover_data = ['candidate', 'party', 'votePer'])
gSen.show()
```



5. Load 1962_2006_walmart_store_openings.csv and use Plotly to create the following map. The map must have a title and legend.

In [20]:
```
walmart = pd.read_csv('1962_2006_walmart_store_openings.csv')
walmart.tail(2)
```

Out[20]:

	storenum	OPENDATE	date_super	conversion	st	county	STREETADDR	STRCITY	STRSTATE	ZIPCOI
2990	3425	1/27/06	1/27/06	0.0	48	201	9598 Rowlett Rd	Houston	TX	770
2991	5193	1/31/06	NaN	NaN	6	65	12721 Moreno Beach Dr	Moreno Valley	CA	925

a. (Figure 4) Create a Scattergeo map that shows the location of every Walmart store opened since 2000 (including 2000) in the United States.

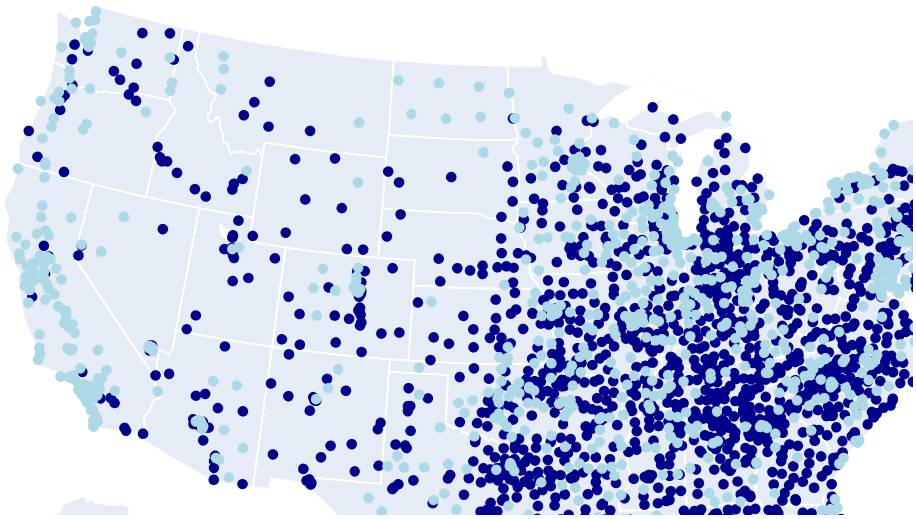
b. The map should show the entire United States. c. If it's a "Supercenter", use a dark blue color to fill the marker. If it's a "Wal-Mart", use a light blue color.

In [21]:
```
walmart2000 = walmart['YEAR']<=2000
walmart[walmart2000].tail(2)
```

Out[21]:

	storenum	OPENDATE	date_super	conversion	st	county	STREETADDR	STRCITY	STRSTATE	ZIPCOI
2444	2938	9/20/00	9/20/00	1.0	22	55	2428 WEST PINHOOK ROAD	Lafayette	LA	705
2445	2603	1/26/00	NaN	NaN	42	3	300 WAL-MART DRIVE	Gibsonia	PA	150

In [22]:
```
df = walmart[walmart2000]
fig = px.scatter_geo(df, lat='LAT', lon='LON',
                     color="type_store", # which column to use to set the color of
markers
                     hover_name="STRCITY",
                    scope='usa',
                    color_discrete_sequence=['darkblue', 'lightblue'])
fig.show()
```



6. Load wimbledons_champions.csv and use Google Maps Services Python client to create the following map.

In [23]:
```
champions = pd.read_csv('wimbledons_champions.csv')
champions
```

Out[23]:

	Gender	Champion	Mins	Runner-up Nationality	Champion Nationality	Runner-up	Score	Runner-up Seed	Champion Seed	Year	Runner-up Nationality (Men's
0	Men's	G.L. Patterson	NaN	AUS	AUS	N.E. Brookes	6-3, 7-5, 6-2	NaN	NaN	1919	NaN
1	Men's	G.L. Patterson	NaN	GBR	AUS	R. Lycett	6-3, 6-4, 6-2	NaN	NaN	1922	NaN
2	Men's	N.E. Brookes	NaN	GBR	AUS	A.W. Gore	6-4, 6-2, 6-2	NaN	NaN	1907	NaN
3	Men's	N.E. Brookes	NaN	NZL	AUS	A.F. Wilding	6-4, 6-4, 7-5	NaN	NaN	1914	NaN
4	Men's	J.R. Borotra	80.0	FRA	FRA	J.R. Lacoste	6-1, 3-6, 6-1, 3-6, 6-4	NaN	NaN	1924	NaN
...	...	...	...	...	...	...	...	...	...	...	..
248	Women's	V.E.S. Williams	84.0	NaN	USA	NaN	6-3, 7-6 (7-3)	2	5.0	2000	USA
249	Women's	S.J. Fry	50.0	NaN	USA	NaN	6-3, 6-1,	6	5.0	1956	GBR
250	Women's	S. Williams	122.0	NaN	USA	NaN	6-1, 5-7, 6-2	3	6.0	2012	POL
251	Women's	V.E.S. Williams	111.0	NaN	USA	NaN	7-5, 6-4	6	7.0	2008	USA
252	Women's	J.R. Susman	57.0	NaN	USA	NaN	6-4, 6-4,	NaN	8.0	1962	TCH

253 rows × 12 columns

a. (Figure 5) Create a map showing the number of champions for different countries.

b. The map should show the entire world. c. Calculate how many Wimbledon champions each country has produced. d. Place a marker for each country that has produced a champion. Use the latitude and longitude of the capital of the country as the location. i. You will need to find the latitude and longitude for the capitals yourself. e. The size of the marker should be proportional to the number of champions this country has produced.

In [24]:
```
champions['Champion Nationality'].unique()
```

Out[24]:
```
array(['AUS', 'FRA', 'GBR', 'NZL', 'USA', 'SRB', 'SUI', 'SWE', 'CZE',
       'ESP', 'GER', 'NED', 'CRO', 'BRA', 'RUS'], dtype=object)
```

In [25]:
```
RUS = champions['Champion Nationality'] == 'RUS'
RUS = champions[RUS]
RUS['lat'] = 55.7558
RUS['lon'] = 37.6173
RUS['numWin'] = RUS.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [26]:
```
BRA = champions['Champion Nationality'] == 'BRA'
BRA = champions[BRA]
BRA['lat'] = -15.8267
BRA['lon'] = -47.9218
BRA['numWin'] = BRA.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
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Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [27]:
```
CRO = champions['Champion Nationality'] == 'CRO'
CRO = champions[CRO]
CRO['lat'] = 45.8150
CRO['lon'] = 15.9819
CRO['numWin'] = CRO.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [28]:
```
NED = champions['Champion Nationality'] == 'NED'
NED = champions[NED]
NED['lat'] = 52.3667
NED['lon'] = 4.8945
NED['numWin'] = NED.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [29]:
```
GER = champions['Champion Nationality'] == 'GER'
GER = champions[GER]
GER['lat'] = 52.5200
GER['lon'] = 13.4050
GER['numWin'] = GER.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [30]:
```
ESP = champions['Champion Nationality'] == 'ESP'
ESP = champions[ESP]
ESP['lat'] = 40.4168
ESP['lon'] = -3.7038
ESP['numWin'] = ESP.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
opyWarning:


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Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
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Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [31]:
```
CZE = champions['Champion Nationality'] == 'CZE'
CZE = champions[CZE]
CZE['lat'] = 50.0755
CZE['lon'] = 14.4378
CZE['numWin'] = CZE.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
opyWarning:


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Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [32]:
```
SWE = champions['Champion Nationality'] == 'SWE'
SWE = champions[SWE]
SWE['lat'] = 59.3293
SWE['lon'] = 18.0686
SWE['numWin'] = SWE.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
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A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [33]:
```
SUI = champions['Champion Nationality'] == 'SUI'
SUI = champions[SUI]
SUI['lat'] = 46.204391
SUI['lon'] = 6.143158
SUI['numWin'] = SUI.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
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See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [34]:
```
SRB = champions['Champion Nationality'] == 'SRB'
SRB = champions[SRB]
SRB['lat'] = 44.7866
SRB['lon'] = 20.4489
SRB['numWin'] = SRB.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [35]:
```
USA = champions['Champion Nationality'] == 'USA'
USA = champions[USA]
USA['lat'] = 38.9072
USA['lon'] = -77.0369
USA['numWin'] = USA.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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Try using .loc[row_indexer,col_indexer] = value instead

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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
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See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [36]:
```
NZL = champions['Champion Nationality'] == 'NZL'
NZL = champions[NZL]
NZL['lat'] = -41.2865
NZL['lon'] = 174.7762
NZL['numWin'] = NZL.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [37]:
```
GBR = champions['Champion Nationality'] == 'GBR'
GBR = champions[GBR]
GBR['lat'] = 51.5074
GBR['lon'] = -0.1278
GBR['numWin'] = GBR.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
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C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [38]:
```
AUS = champions['Champion Nationality'] == 'AUS'
AUS = champions[AUS]
AUS['lat'] = -35.2809
AUS['lon'] = 149.1300
AUS['numWin'] = AUS.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [39]:
```
FRA = champions['Champion Nationality'] == 'FRA'
FRA = champions[FRA]
FRA['lat'] = 48.8566
FRA['lon'] = 2.3522
FRA['numWin'] = FRA.shape[0]
```

```
C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWithC
opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy

C:\Users\Juney\Anaconda3\lib\site-packages\ipykernel_launcher.py:4: SettingWithC
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Try using .loc[row_indexer,col_indexer] = value instead

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opyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [40]:
```
champions = AUS.merge(FRA, how='outer')
champions = champions.merge(GBR, how='outer')
champions = champions.merge(NZL, how='outer')
champions = champions.merge(USA, how='outer')
champions = champions.merge(SRB, how='outer')
champions = champions.merge(SUI, how='outer')
champions = champions.merge(SWE, how='outer')
champions = champions.merge(CZE, how='outer')
champions = champions.merge(ESP, how='outer')
champions = champions.merge(GER, how='outer')
champions = champions.merge(NED, how='outer')
champions = champions.merge(CRO, how='outer')
champions = champions.merge(BRA, how='outer')
champions = champions.merge(RUS, how='outer')
```

In [41]:
```
champions
```

Out[41]:

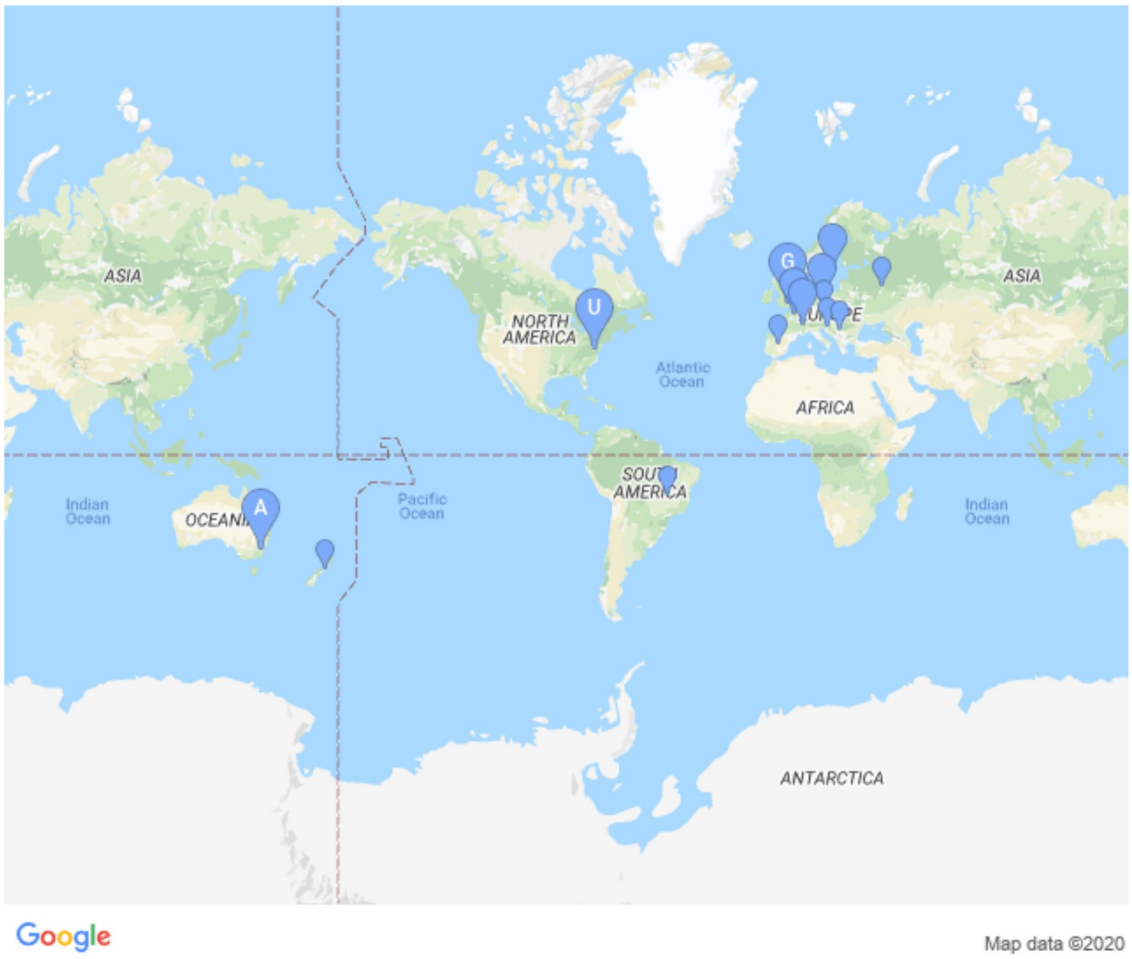
	Gender	Champion	Mins	Runner-up Nationality	Champion Nationality	Runner-up	Score	Runner-up Seed	Champion Seed	Year	Runner-up Nationality (Men's
0	Men's	G.L. Patterson	NaN	AUS	AUS	N.E. Brookes	6-3, 7-5, 6-2	NaN	NaN	1919	NaN
1	Men's	G.L. Patterson	NaN	GBR	AUS	R. Lycett	6-3, 6-4, 6-2	NaN	NaN	1922	NaN
2	Men's	N.E. Brookes	NaN	GBR	AUS	A.W. Gore	6-4, 6-2, 6-2	NaN	NaN	1907	NaN
3	Men's	N.E. Brookes	NaN	NZL	AUS	A.F. Wilding	6-4, 6-4, 7-5	NaN	NaN	1914	NaN
4	Men's	R.G. Laver	60.0	AUS	AUS	A.D. Roche	6-3, 6-4, 6-2	15	1.0	1968	NaN
...	...	...	...	...	...	...	...	...	...	...	..
248	Men's	G.S. Ivanisevic	182.0	AUS	CRO	P.M. Rafter	6-3, 3-6, 6-3, 2-6, 9-7	3	NaN	2001	NaN
249	Women's	M.E.A. Bueno	59.0	NaN	BRA	NaN	8-6, 6-0	8	1.0	1960	RSA
250	Women's	M.E.A. Bueno	90.0	NaN	BRA	NaN	6-4, 7-9, 6-3,	1	2.0	1964	AUS
251	Women's	M.E.A. Bueno	43.0	NaN	BRA	NaN	6-4, 6-3,	4	6.0	1959	USA
252	Women's	M. Sharapova	74.0	NaN	RUS	NaN	6-1, 6-4	1	13.0	2004	USA

253 rows × 15 columns

In [42]:
```
champMid = champions['numWin']>=20
champions[champMid]['Champion Nationality'].unique()

champTiny = champions['numWin']<=5
champions[champTiny]['Champion Nationality'].unique()

champSmall = champions['numWin']<=20
champions[champSmall]['Champion Nationality'].unique()
```

Out[42]:
```
array(['FRA', 'NZL', 'SRB', 'SUI', 'SWE', 'CZE', 'ESP', 'GER', 'NED',
       'CRO', 'BRA', 'RUS'], dtype=object)
```

In [43]:
```
import googlemaps
import io
from IPython.display import Image, display
from googlemaps.maps import StaticMapMarker

apiKey = 'AIzaSyDhkyLC5StbqUSjYFaOV7ZKYzA4t3Q5xcM'
apiKeyPro = 'AIzaSyAbyii-sn8o_L5MsNR1YB7tpgUtb2BvXdk'

gmaps = googlemaps.Client(key=apiKeyPro)

SRBlat = 44.7866
SRBlon = 20.4489

SUIlat = 46.204391
SUIlon = 6.143158

SWElat = 59.3293
SWElon = 18.0686

CZElat = 50.0755
CZElon = 14.4378

ESPlat = 40.4168
ESPlon = -3.7038

GERlat = 52.5200
GERlon = 13.4050

NEDlat = 52.3667
NEDlon = 4.8945

CROlat = 45.8150
CROlon = 15.9819

BRAlat = -15.8267
BRAlon = -47.9218

RUSlat = 55.7558
RUSlon = 37.6173

my_markers = [StaticMapMarker(
    locations={'lat':-35.2809, 'lng':149.1300},
    size="mid", color="blue", label='A'),
             StaticMapMarker(
    locations={'lat':48.8566, 'lng':2.3522},
    size="small", color="blue", label='F'),
             StaticMapMarker(
    locations={'lat':51.5074, 'lng':-0.1278},
    size="mid", color="blue", label='G'),
             StaticMapMarker(
    locations={'lat':-41.2865, 'lng':174.7762},
    size="tiny", color="blue", label='N'),
             StaticMapMarker(
    locations={'lat':38.9072, 'lng':-77.0369},
    size="mid", color="blue", label='U'),
             StaticMapMarker(
    locations={'lat':44.7866, 'lng':20.4489},
    size="tiny", color="blue", label='S'),
             StaticMapMarker(
    locations={'lat':SUIlat, 'lng':SUIlon},
    size="small", color="blue", label='S'),
             StaticMapMarker(
    locations={'lat':SWElat, 'lng':SWElon},
    size="small", color="blue", label='S'),
```


ASIA
NORTH AMERICA
Atlantic Ocean
AFRICA
ASIA
Indian Ocean
Pacific Ocean
Indian Ocean
ANTARCTICA
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Map data ©2020

In [ ]: