

# Exploring numerical variables

## Mapping

Source: **Plotly**.

In [1]:

```
%matplotlib inline
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

Import data

Here we load a GeoJSON file containing the geometry information for US counties, where `feature.id` is a FIPS code.

In [2]:

```
from urllib.request import urlopen
import json
with urlopen('https://raw.githubusercontent.com/kirenz/modern-statistics/main/data/geojson-counties-fips.json') as response:
    counties = json.load(response)

counties["features"][0]
```

Out[2]:

```
{ 'type': 'Feature',
  'properties': { 'GEO_ID': '05000000US01001',
    'STATE': '01',
    'COUNTY': '001',
    'NAME': 'Autauga',
    'LSAD': 'County',
    'CENSUSAREA': 594.436},
  'geometry': { 'type': 'Polygon',
    'coordinates': [[[-86.496774, 32.344437],
      [-86.717897, 32.402814],
      [-86.814912, 32.340803],
      [-86.890581, 32.502974],
      [-86.917595, 32.664169],
      [-86.71339, 32.661732],
```

```
[-86.714219, 32.705694],  
[-86.413116, 32.707386],  
[-86.411172, 32.409937],  
[-86.496774, 32.344437]]]},  
'id': '01001'}
```

Here we load unemployment data by county, also indexed by FIPS code.

In [4]:

```
df = pd.read_csv("https://raw.githubusercontent.com/kirenz/modern-statistics/main/data/fips-unemp-16.csv",  
                 dtype={"fips": str})  
df.head()
```

Out[4]:

	fips	unemp
0	01001	5.3
1	01003	5.4
2	01005	8.6
3	01007	6.6
4	01009	5.5



Additionally, let's load a data enriched version of our county dataset:

In [5]:

```
import plotly.express as px

fig = px.choropleth(df, geojson=counties, locations='fips', color='unemp',
                    color_continuous_scale="Viridis",
                    range_color=(0, 12),
                    scope="usa",
                    labels={'unemp':'unemployment rate'})

fig.update_layout(margin={"r":0,"t":0,"l":0,"b":0})
fig.show()
```



