Import neccessary libraries

In [1]:
```
import datetime
import os
import time
import pandas as pd
import string
import collections
```

path to the 2 csv files

In [2]:
```
path='D:/coding/changes.csv'
Data2=pd.read_csv(path , encoding='latin1')
path='D:/coding/vaccinations.csv'
Data=pd.read_csv(path , encoding='latin1')
```

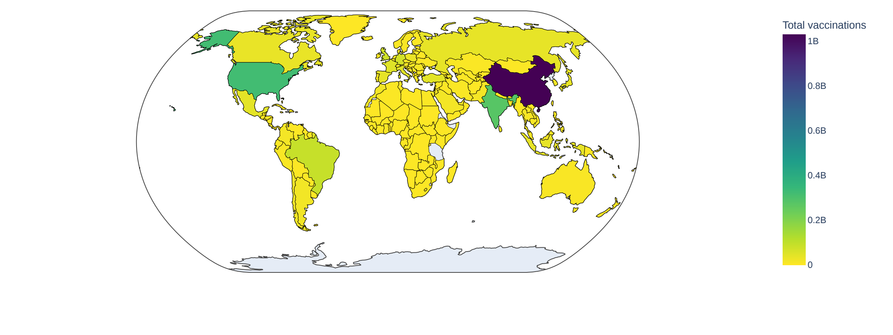
In [3]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.graph_objs as go
import plotly.figure_factory as ff
from plotly import tools
from plotly.offline import download_plotlyjs, init_notebook_mode, plot, iplot
import plotly.express as px
init_notebook_mode(connected=True)
import warnings
warnings.filterwarnings("ignore")
```

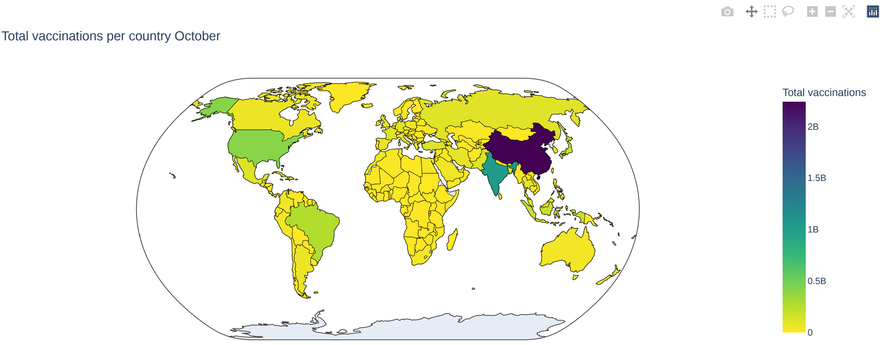
specify the necessary columns

In [4]:
```
country_vaccine = Data.groupby(["country", "iso_code", "vaccines"])['total_vaccinations',
                                                                     'total_vaccinations_per_hundred',
                                                                    'daily_vaccinations',
                                                                    'daily_vaccinations_per_million',
                                                                    'people_vaccinated',
                                                                    'people_vaccinated_per_hundred',
                                                                     'people_fully_vaccinated', 'people_fully_vaccinated_per_hundred'
                                                                    ].max().reset_index()
country_vaccine.columns = ["Country", "iso_code", "Vaccines", "Total vaccinations", "Percent", "Daily vaccinations",
                           "Daily vaccinations per million", "People vaccinated", "People vaccinated per hundred",
                           'People fully vaccinated', 'People fully vaccinated percent']

country_vaccine2 = Data2.groupby(["count", "iso", "vac"])['total_vac',
                                                                    'total_vaccinations_per_hun',
                                                                    'daily_vac',
                                                                    'daily_vaccinations_per_mil',
                                                                    'people_vac',
                                                                    'people_vaccinated_per_hun',
                                                                     'people_fully_vac', 'people_fully_vaccinated_per_hun'
                                                                    ].max().reset_index()
country_vaccine2.columns = ["Count", "iso", "Vac", "Total vac", "Percent", "Daily vac",
                           "Daily vaccinations per mil", "People vac", "People vaccinated per hun",
                           'People fully vac', 'People fully vaccinated percent']
```

draw the 2 world maps

In [5]:
```
trace = go.Choropleth(
            locations = country_vaccine['Country'],
            locationmode='country names',
            z = country_vaccine['Total vaccinations'],
            text = country_vaccine['Country'],
            autocolorscale =False,
            reversescale = True,
            colorscale = 'viridis',
            marker = dict(
                line = dict(
                    color = 'rgb(0,0,0)',
                    width = 0.5)
            ),
            colorbar = dict(
                title = 'Total vaccinations',
                tickprefix = '')
        )

data = [trace]
layout = go.Layout(
    title = 'Total vaccinations per country July',
    geo = dict(
        showframe = True,
        showlakes = False,
        showcoastlines = True,
        projection = dict(
            type = 'natural earth'
        )
    )
)

fig = dict( data=data, layout=layout )
iplot(fig)

trace = go.Choropleth(
            locations = country_vaccine2['Count'],
            locationmode='country names',
            z = country_vaccine2['Total vac'],
            text = country_vaccine2['Count'],
            autocolorscale =False,
            reversescale = True,
            colorscale = 'viridis',
            marker = dict(
                line = dict(
                    color = 'rgb(0,0,0)',
                    width = 0.5)
            ),
            colorbar = dict(
                title = 'Total vaccinations',
                tickprefix = '')
        )

data = [trace]
layout = go.Layout(
    title = 'Total vaccinations per country October',
    geo = dict(
        showframe = True,
        showlakes = False,
        showcoastlines = True,
        projection = dict(
            type = 'natural earth'
        )
    )
)

fig = dict( data=data, layout=layout )
iplot(fig)
```





The two world maps show how vaccination rates have changed from July to early October, with more people being vaccinated as of October as compared to July. Countries like Tanzania did not have even one person vaccinated as of July but by October they had at least 885,579 people vaccinated. As per the maps we see that the highest vaccinated country is China with about 2.24Billion people vaccinatedprobably because the virus first originated from the country. In July United States of America had more people vaccinated than India but currently India has the higher vaccination numbers this can be because of the deadly Covid-19 outbreak that devastated the country. United States of America numbers are growing slower than other countries because of the Anti-Vax movement in the country. Africa can be seen as the continent with the least number of vaccinated people mainly because no African country has invented the vaccine we all depend on foreign countries to donate vaccines to our countries or buy at subsidery prices. Morocco has the most vaccinated people in Afrcia with about 45Million people vaccinated.