```python
In [1]: import pandas as pd
        import pytrends as gt
        from pytrends.request import TrendReq
        import matplotlib.pyplot as plt
        import seaborn as sns
        from pywaffle import Waffle
        import folium
```

```python
In [2]: webtrends = TrendReq()
        youtubetrends = TrendReq()
        newstrends = TrendReq()


        kw_list = ["AWS+Amazon Web Services", "Azure+Microsoft Azure", "GCP+Google Cloud"]

        webtrends.build_payload(kw_list=kw_list, timeframe='today 5-y', geo='US', gprop='')
        youtubetrends.build_payload(kw_list=kw_list, timeframe='today 5-y', geo='US', gprop='youtube')
        newstrends.build_payload(kw_list=kw_list, timeframe='today 5-y', geo='US', gprop='news')
```

```python
In [3]: web_interest = webtrends.interest_over_time()
        youtube_interest = youtubetrends.interest_over_time()
        news_interest = newstrends.interest_over_time()
```

```python
In [ ]:
```

```python
In [4]: web_interest = web_interest.loc[web_interest.isPartial != "True"]
        youtube_interest = youtube_interest.loc[youtube_interest.isPartial != "True"]
        news_interest = news_interest.loc[news_interest.isPartial != "True"]
```

```
In [19]:  fig,a =  plt.subplots(1,3, figsize=(24,10))
          web_interest.plot(ax=a[0], title="Web Search Interest over Time")
          youtube_interest.plot(ax=a[1], title="Youtube Search Interest over Time")
          news_interest.plot(ax=a[2], title="News Search Interest over Time")
```

Out[19]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8c62f75950>
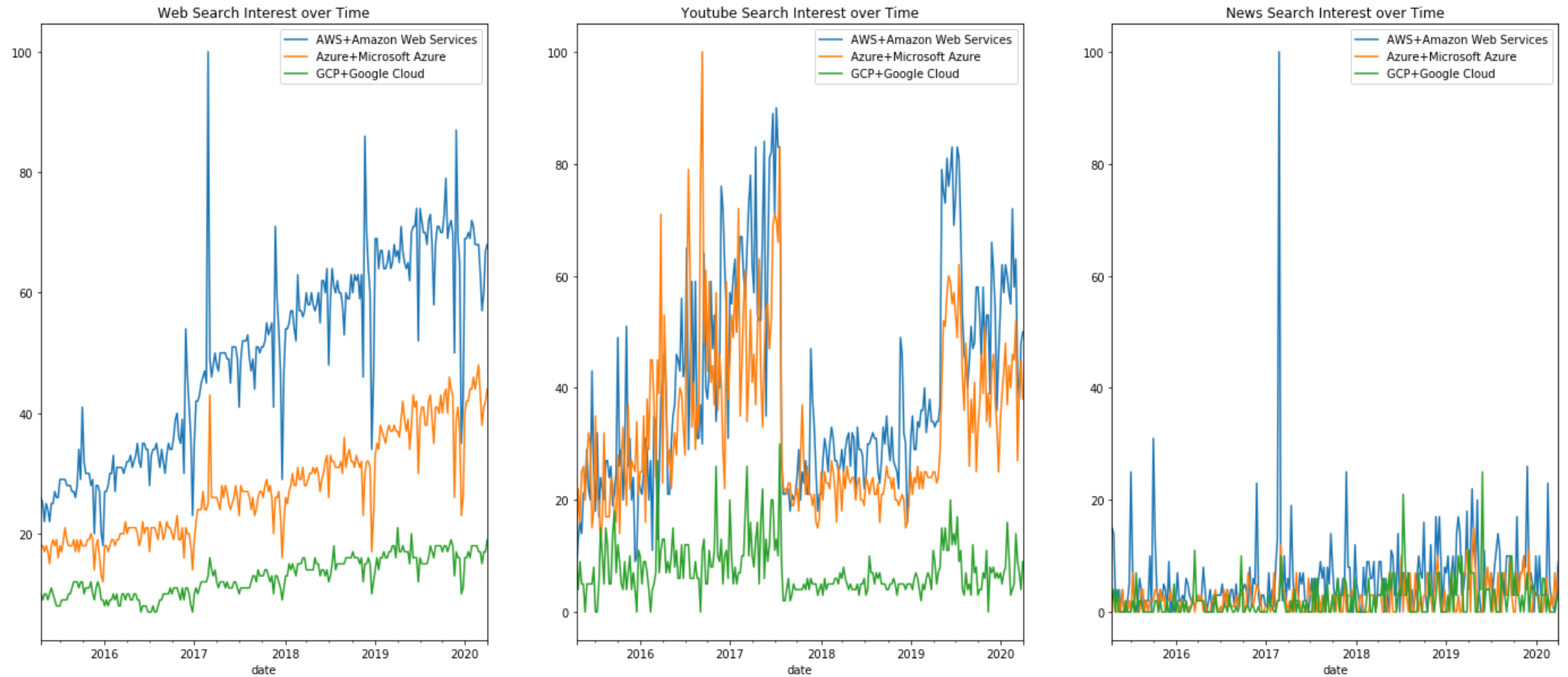

```
In [6]:  # major outage happened on Feb 28 2017
         # massive S3 failure in AWS brought down many sites like Slack, Trello, Quora
```

```python
In [29]: webavg = web_interest.mean().to_dict()
         fig = plt.figure(
             FigureClass=Waffle,
             rows=5,
             values=webavg,
             legend={'loc': 'upper left', 'bbox_to_anchor': (1.1, 1)},
             figsize=(9,8)
         )
         youtubeavg = youtube_interest.mean().to_dict()
         fig = plt.figure(
             FigureClass=Waffle,
             rows=5,
             values=youtubeavg,
             legend={'loc': 'upper left', 'bbox_to_anchor': (1.1, 1)},
             figsize=(9,8)
         )
         newsavg = news_interest.mean().to_dict()
         fig = plt.figure(
             FigureClass=Waffle,
             rows=1,
             values=newsavg,
             legend={'loc': 'upper left', 'bbox_to_anchor': (1.1, 1)},
             figsize=(9,8)
         )
```

AWS+Amazon Web Services
Azure+Microsoft Azure
GCP+Google Cloud

AWS+Amazon Web Services
Azure+Microsoft Azure
GCP+Google Cloud

AWS+Amazon Web Services
Azure+Microsoft Azure
GCP+Google Cloud

In [ ]:
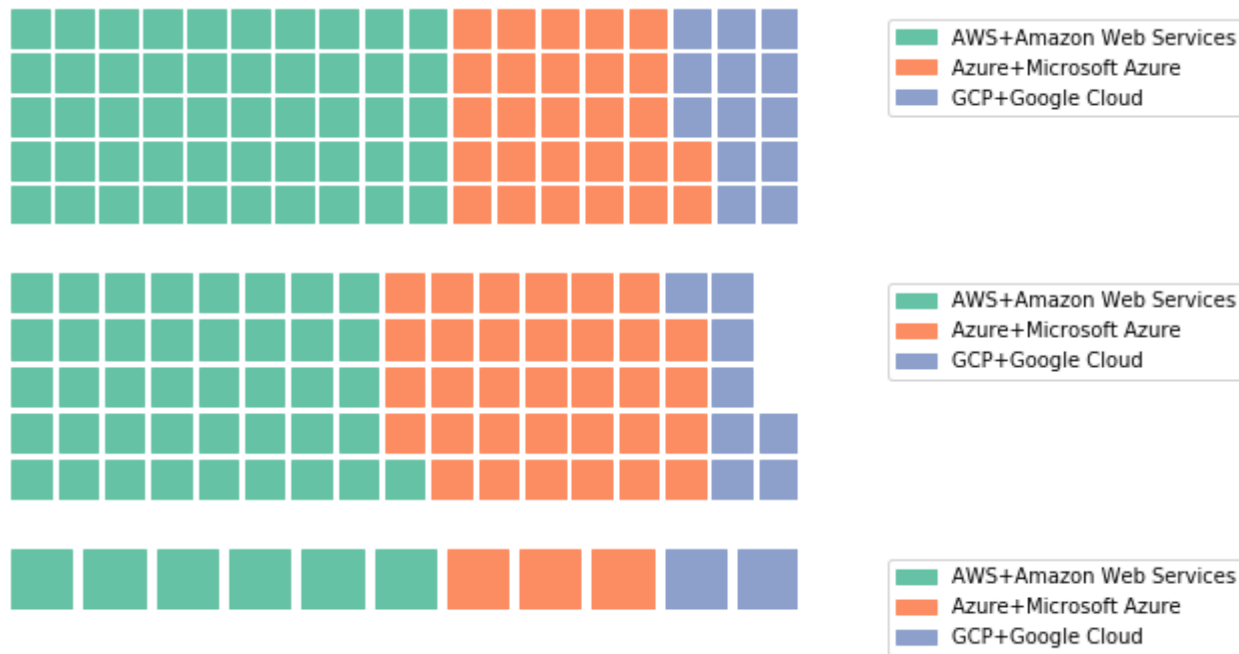
In [33]:
```python
web_by_state = webtrends.interest_by_region()
```

In [44]:
```python
web_by_dma = webtrends.interest_by_region(resolution="DMA", inc_geo_code=True, inc_low_vol=False)
```

In [ ]:

In [56]:
```python
state_geo
```

Out[56]: 'https://raw.githubusercontent.com/python-visualization/folium/master/examples/data/us-states.json'

In [ ]:

```python
url = 'https://raw.githubusercontent.com/python-visualization/folium/master/examples/data'
state_geo = f'{url}/us-states.json'

m1 = folium.Map(location=[48, -102], zoom_start=3)

web_state_aws = web_by_state.reset_index()[["geoName", "AWS+Amazon Web Services"]]

folium.Choropleth(
    geo_data=state_geo,
    name='choropleth',
    data=web_state_aws,
    columns=['geoName', 'AWS+Amazon Web Services'],
    key_on='feature.properties.name',
    fill_color='YlGn',
    fill_opacity=0.7,
    line_opacity=0.2,
    legend_name='Unemployment Rate (%)'
).add_to(m1)

folium.LayerControl().add_to(m1)

m1
```

Out[63]:

Unemployment Rate (%)

21 30 40 49 58 68 77

Leaflet (https://leafletjs.com) | Data by © OpenStreetMap (http://openstreetmap.org), under ODbL (http://www.openstreetmap.org/copyright).

```python
m2 = folium.Map(location=[48, -102], zoom_start=3)

web_state_azure = web_by_state.reset_index()[["geoName", "Azure+Microsoft Azure"]]

folium.Choropleth(
    geo_data=state_geo,
    name='choropleth',
    data=web_state_azure,
    columns=['geoName', 'Azure+Microsoft Azure'],
    key_on='feature.properties.name',
    fill_color='YlGn',
    fill_opacity=0.7,
    line_opacity=0.2,
    legend_name='Unemployment Rate (%)'
).add_to(m2)

folium.LayerControl().add_to(m2)

m2
```
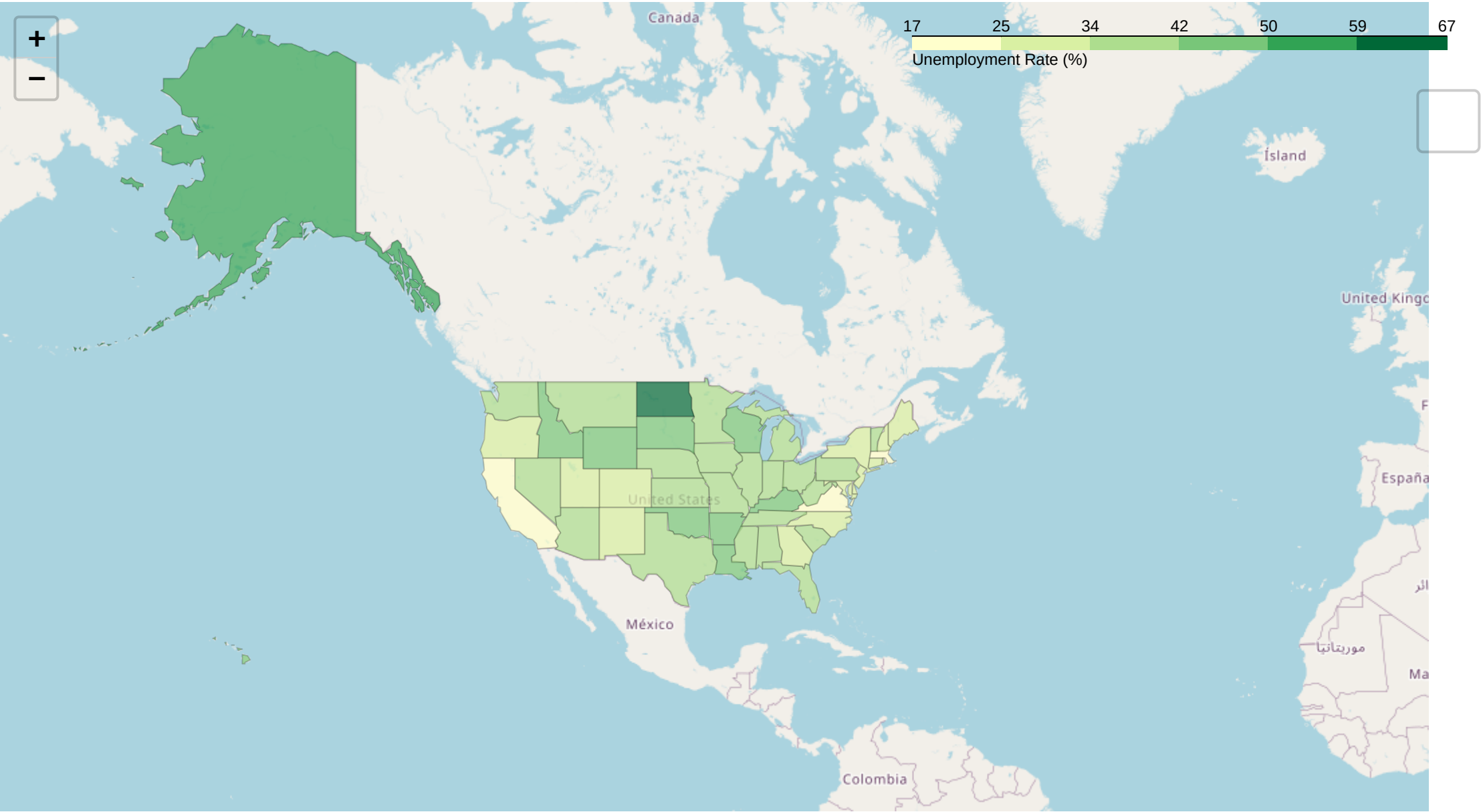
```python
m3 = folium.Map(location=[48, -102], zoom_start=3)

web_state_gcp= web_by_state.reset_index()[["geoName", "GCP+Google Cloud"]]

folium.Choropleth(
    geo_data=state_geo,
    name='choropleth',
    data=web_state_gcp,
    columns=['geoName', 'GCP+Google Cloud'],
    key_on='feature.properties.name',
    fill_color='YlGn',
    fill_opacity=0.7,
    line_opacity=0.2,
    legend_name='Unemployment Rate (%)'
).add_to(m3)

folium.LayerControl().add_to(m3)

m3
```
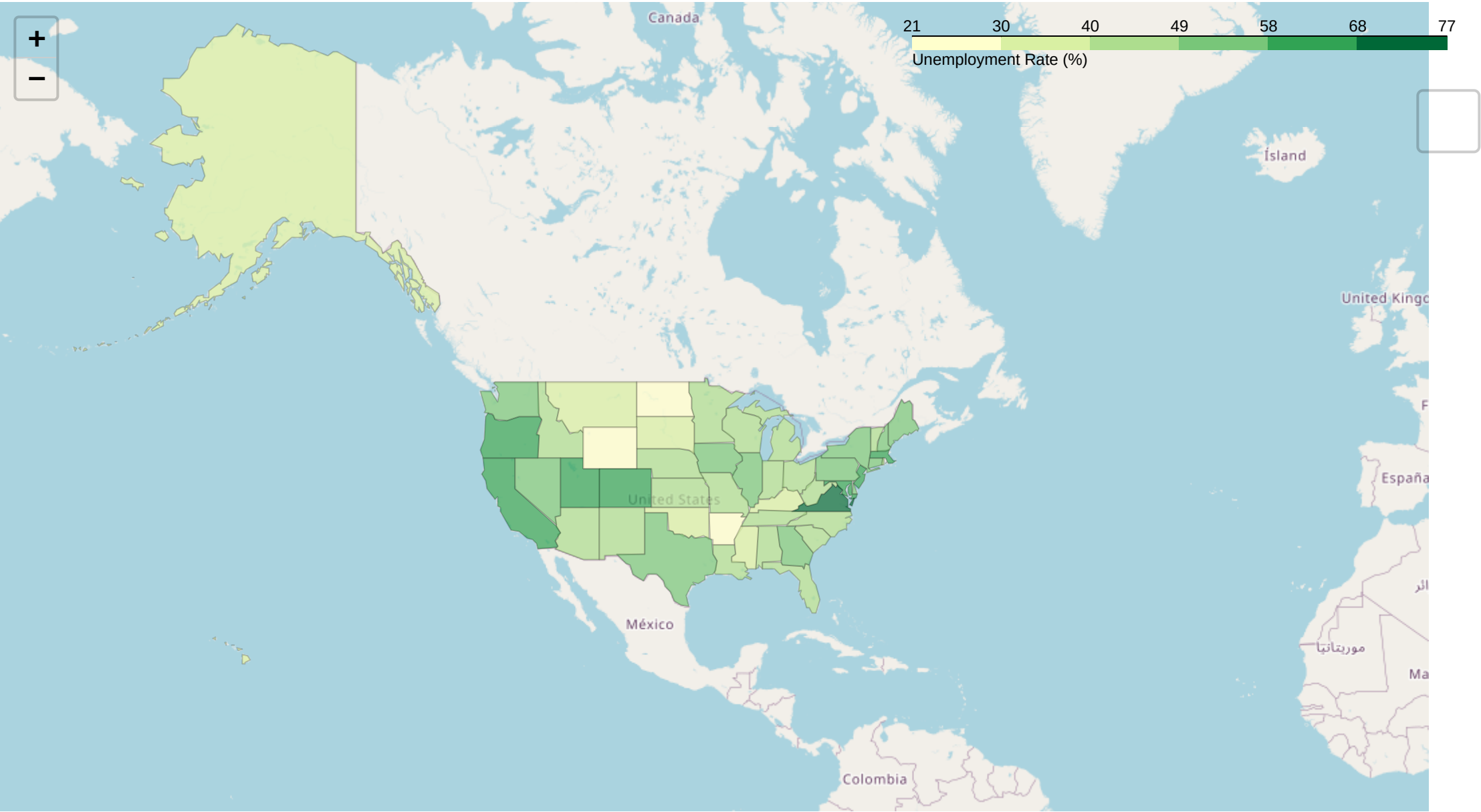
Unemployment Rate (%)

Leaflet (https://leafletjs.com) | Data by © OpenStreetMap (http://openstreetmap.org), under ODbL (http://www.openstreetmap.org/copyright).
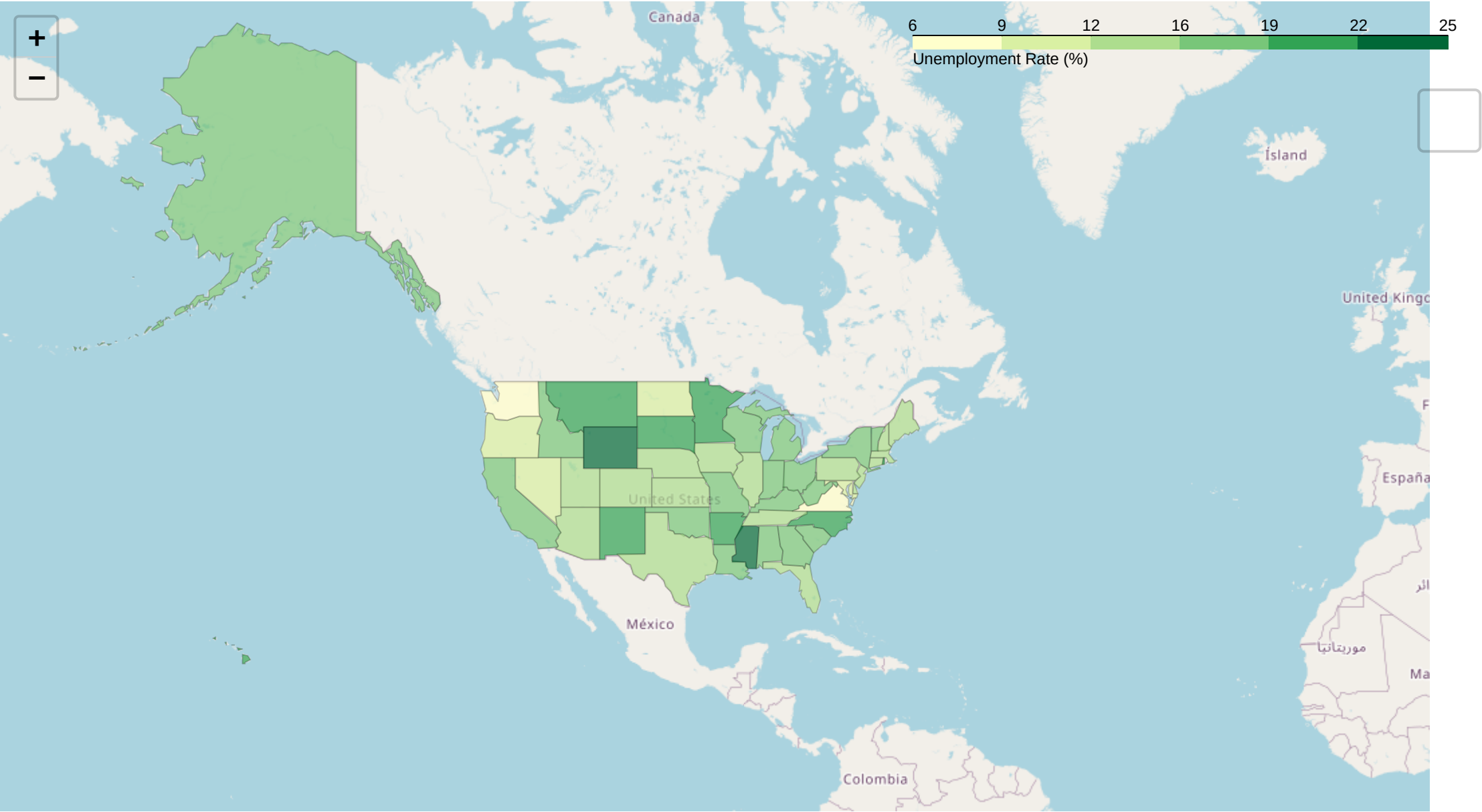
```
In [75]: web_by_state.plot(kind="bar", figsize=(25,10))
```

```
Out[75]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8c606b7090>
```
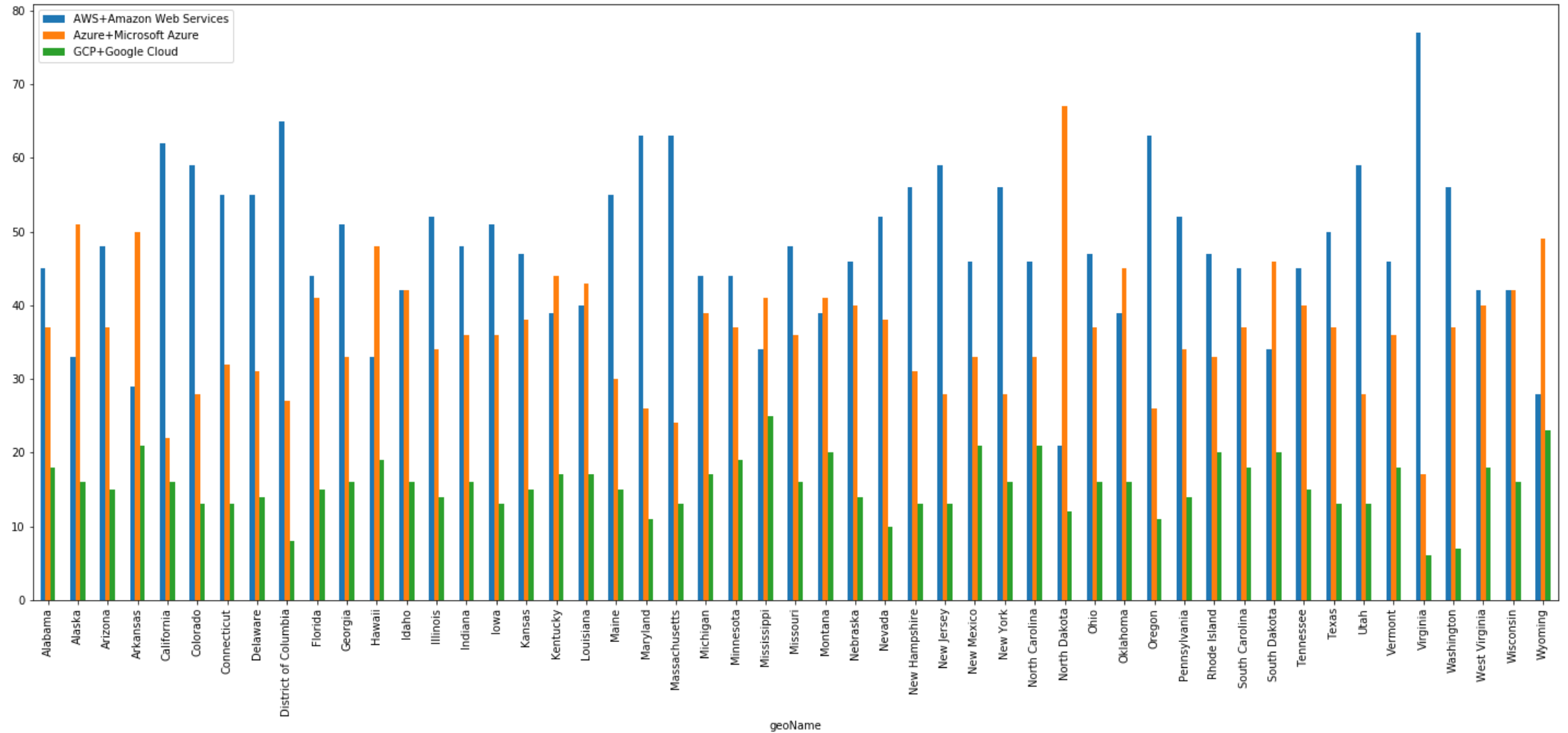


```
In [77]: webrq = webtrends.related_queries()
```

```
In [81]: youtuberq = youtubetrends.related_queries()
```

```
In [83]: newsrq = newstrends.related_queries()
```

```
In [103]: fig, ax = plt.subplots(2,3, figsize=(25,16), squeeze=False)
          webrq["AWS"]["top"].set_index("query").plot(ax=ax[0][0], kind="barh", title="AWS Top")
          webrq["AWS"]["rising"].set_index("query").plot(ax=ax[1][0], kind="barh", title="AWS Rising")

          webrq["Azure"]["top"].set_index("query").plot(ax=ax[0][1], kind="barh", title="Azure Top")
          webrq["Azure"]["rising"].set_index("query").plot(ax=ax[1][1], kind="barh", title="Azure Rising")

          webrq["GCP"]["top"].set_index("query").plot(ax=ax[0][2], kind="barh", title="GCP Top")
          webrq["GCP"]["rising"].set_index("query").plot(ax=ax[1][2], kind="barh", title="GCP Rising")
          plt.tight_layout()
          plt.show()
```

AWS Top

query	value
aws connect	
aws docker	
aws cloudformation	
aws login	
aws account	
aws services	
iam aws	
aws sdk	
aws vpc	
azure	
aws security	
aws rds	
what is aws	
aws pricing	
aws certification	
aws server	
aws api	
aws console	
aws cloud	
aws cli	
lambda aws	
ec2 aws	
ec2	
aws s3	
aws amazon	

Azure Top

query	value
azure app service	
azure sql database	
azure security	
azure blue	
azure management	
azure account	
azure standard	
azure login	
active directory	
azure active directory	
azure services	
azure api	
azure pricing	
what is azure	
azure powershell	
azure devops	
azure vm	
aws	
portal azure	
devops	
windows azure	
azure storage	
azure cloud	
sql azure	
azure ad	

GCP Top

query	value
google gcp	
amazon cloud	
google cloud free	
google docs	
google cloud printer	
printer	
google cloud photos	
sound cloud	
google photos	
what is google cloud	
google classroom	
aws	
my google cloud	
my cloud	
google cloud platform	
the cloud	
google drive	
google drive cloud	
cloud drive	
google cloud storage	
google storage	
cloud storage	
google print	
cloud print	
google cloud print	

AWS Rising

query	value
aws certificate manager	
aws api gateway	
aws appsync	
aws cloud9	
aws secrets manager	
aws lex	
aws practice exam	
aws quicksight	
terraform aws	
terraform	
aws step functions	
aws educate	
aws codebuild	
aws snowball	
aws amplify	
aws lightsail	
aws sagemaker	
aws fargate	
aws ecr	
aws cloud practitioner	
aws ssm	
aws efs	
aws athena	
aws glue	
aws iot	

Azure Rising

query	value
azure hotel ontario	
azure stream analytics	
azure cognitive services	
hotel azure tahoe	
azure ad connect	
azure nsg	
azure notebooks	
azure iot hub	
nights of azure 2	
devops	
azure resource manager	
azure pipelines	
azure lularoe sizing	
azure dev ops	
azure information protection	
azure application gateway	
azure b2c	
azure mines	
azure cosmos db	
azure databricks	
kubernetes	
azure kubernetes	
azure data lake	
nights of azure	
azure functions	

GCP Rising

query	value
google cloud machine learning	
kubernetes	
google cloud next 2020	
gcp technologies	
gcp cloud	
gcp laboratories	
gcp outage	
google cloud certified professional cloud architect	
gcp pricing calculator	
gcp free tier	
google cloud datalab	
ich gcp e6 r2	
my katy cloud	
google cloud pub sub	
aws certification	
google cloud iot	
google cloud vision api	
google cloud ml	
gsuite	
gcp service account	
nc ed cloud	
terraform gcp	
gcp applied technologies	
nced cloud	
gcp console	