Double-click (or enter) to edit

```
!pip install plotly-geo
```

```
    Collecting plotly-geo
      Downloading plotly_geo-1.0.0-py3-none-any.whl (23.7 MB)
         ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 23.7/23.7 MB 52.5 MB/s eta 0:00:00
    Installing collected packages: plotly-geo
    Successfully installed plotly-geo-1.0.0
```

this command is an instruction to install the "ploty-geo" package.

written material https://raw.githubusercontent.com/stefanbund/py3100/main/ProductList_118.csv

Double-click (or enter) to edit

```
import pandas as pd
import numpy as np
```

these commands are statements in oython used to import the libraries "pandas" and "numpy" to acces objects within those libraies

```
url= 'https://raw.githubusercontent.com/stefanbund/py3100/main/ProductList_118.csv'
url_m= 'https://raw.githubusercontent.com/stefanbund/py3100/main/matrix.csv'
```

the URLs are used to acces and download CSV files directly from the web into a pythonenvironment.

```
df_m = pd.read_csv(url_m)
```

the function df_m = pd.read_csv(url_m) is used to read data from CSV files and create a pandas df object from it.

```
df_m
```

	City	1	2	3	4	5	6	7	8	9	...	32	33	34	35	36	37	38	39	40	41
0	Birmingham	8285	5343	6738	6635	5658	8118	4311	8535	3436	...	1340	6923	3082	5617	3555	1341	1756	7598	1509	1861
1	Montgomery	1287	6585	8300	8874	8208	5363	3552	3387	2765	...	4424	8813	6655	3986	2805	4601	4449	5727	2315	8822
2	Mobile	8035	5569	9492	5905	5024	1107	6937	5580	8044	...	5430	1601	9145	1493	9807	2652	9296	2815	4886	7458
3	Huntsville	6280	2841	3399	5448	6173	5451	7488	9981	5236	...	9169	7829	6879	4166	7935	2605	9982	3338	9116	3875
4	Tuscaloosa	4079	1066	3923	4177	4277	4219	9436	8160	4302	...	1556	5533	1884	2088	3657	2158	4469	2513	8135	6963
5	Hoover	9741	7377	9410	9790	8864	2522	5347	9145	8402	...	6031	7673	8403	7588	9748	7224	4628	8107	6143	1671
6	Dothan	7646	2060	4911	4976	7851	4277	7423	6183	6641	...	8253	1565	6052	5802	5650	4400	7842	4006	9335	3571
7	Auburn	4326	2659	6928	4656	1828	5199	5331	6294	3076	...	6128	3737	7785	3281	4387	6890	2833	5083	9707	2116
8	Decatur	3786	2891	8124	2469	3704	3623	2409	8287	2032	...	6622	9742	9382	8413	9305	6509	6848	5408	3707	8744
9	Madison	1934	3628	9190	3275	9344	5778	1256	3523	1781	...	6619	6128	5325	9976	1746	4470	7054	6573	3556	1374
10	Florence	8017	3187	1128	4706	9962	7547	4440	4530	9569	...	8306	1392	1363	5545	5929	1123	7306	8746	4000	6943
11	Gadsden	2290	6402	8598	7547	5158	9731	8038	4435	7357	...	4488	3591	1683	7343	2549	5175	5997	9608	7230	9731
12	Vestavia Hills	9471	9142	4419	3846	2016	5069	4853	6336	9062	...	4613	2942	7408	9484	5142	9619	9601	8099	1391	6276
16	Bessemer	6559	2453	1578	5158	3058	8075	7066	8530	8346	...	8921	3517	4121	5295	4810	7641	5365	3545	6812	9483

the variable df_m represents a pandas df object thta was created by reading a CSV file using the "pd.read" function

```
#df_m.dtypes
df_m.columns
```

```
Index(['City', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12',
       '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24',
       '25', '26', '27', '28', '29', '30', '31', '32', '33', '34', '35', '36',
       '37', '38', '39', '40', '41'],
      dtype='object')
```

the code #df_m.dtypes df_m.columns returns the data types of each column in the data frame "df_m"

25 rows × 42 columns

```
df_m['City']
```

```
0         Birmingham
1         Montgomery
2             Mobile
3         Huntsville
4         Tuscaloosa
5             Hoover
6             Dothan
7             Auburn
8            Decatur
9            Madison
10          Florence
11           Gadsden
12    Vestavia Hills
13        Prattville
14       Phenix City
15         Alabaster
16          Bessemer
17        Enterprise
18           Opelika
19          Homewood
20         Northport
21            Pelham
22        Trussville
23     Mountain Brook
24          Fairhope
Name: City, dtype: object
```

the code df_m['City'] retrieves the "city" column's data from "df_m"

```
df_m.dtypes
```

```
City     object
1         int64
2         int64
3         int64
4         int64
5         int64
6         int64
7         int64
8         int64
9         int64
10        int64
11        int64
12        int64
13        int64
14        int64
15        int64
16        int64
17        int64
18        int64
19        int64
20        int64
21        int64
22        int64
23        int64
24        int64
25        int64
26        int64
27        int64
28        int64
29        int64
30        int64
31        int64
32        int64
33        int64
34        int64
35        int64
36        int64
37        int64
38        int64
39        int64
40        int64
41        int64
dtype: object
```

the code df_m.dtypes returns the pandas series object that contains the data types of each column in the Data Frame "df_m"

```
df_3 = df_m.quantile([0.25, 0.5, 0.75], numeric_only=True, axis=1)
df_3
```

	0	1	2	3	4	5	6	7	8	9	...	15	16	17	18	19	20	21
0.25	3082.0	3633.0	2236.0	3473.0	3657.0	4628.0	4254.0	3588.0	3704.0	3451.0	...	3449.0	4246.0	4375.0	3217.0	4259.0	2468.0	3646.0
0.50	5343.0	5431.0	5311.0	5771.0	5131.0	7588.0	5156.0	5331.0	6589.0	5875.0	...	6478.0	5944.0	6315.0	5341.0	6472.0	5472.0	5779.0
0.75	7242.0	8074.0	7508.0	7935.0	7490.0	9145.0	6840.0	7606.0	8221.0	7783.0	...	7437.0	8331.0	8436.0	8472.0	8389.0	7877.0	8373.0

3 rows × 25 columns

the code df_3 = df_m.quantile([0.25, 0.5, 0.75], numeric_only=True, axis=1) df_3 calculates the quantiles of the df "df_m" for the quantile values of 0.25,0.50,0.75.

```
l = df_3.T.columns  #transpose, T
l
```

```
Float64Index([0.25, 0.5, 0.75], dtype='float64')
```

the code l = df_3.T.columns #transpose, T l transposes the data from "df_3" and extracts the column labels as a pandas index named "l"

```
df_3.T.mean()
```

```
0.25    3535.24
0.50    5826.36
0.75    7953.00
dtype: float64
```

df_3.T.mean() calculates the mean of each column in the transposed data frame

```
df_3.T[0.25].mean()
```

```
3535.24
```

df_3.T[0.25].mean() calculates the mean for the 0.25 quartile

```
df_3.T[0.5].mean()
```

```
5826.36
```

df_3.T[0.5].mean()calculates the mean for the 0.50 quartile

```
df_3.T[0.75].mean()
```

```
7953.0
```

df_3.T[0.75].mean() calculates the mean for the 0.75 quartile

```
kk = df_3.T.mean()
kk #series
```

```
0.25    3535.24
0.50    5826.36
0.75    7953.00
dtype: float64
```

the code kk = df_3.T.mean() calculates the mean average of each column in the transposed dataframe "df_3T" and assigns the results to a new variable "kk"

```
# n =
((df_m.iloc[:, 1:] <= kk[0.25]).sum(axis=1) / df_m.shape[1]) * 100
# print(round(n))
```

```
0     28.571429
1     21.428571
2     38.095238
3     26.190476
4     21.428571
5     16.666667
6     19.047619
7     23.809524
8     21.428571
9     28.571429
10    26.190476
```

```
    11    19.047619
    12    26.190476
    13    23.809524
    14    28.571429
    15    28.571429
    16    14.285714
    17    19.047619
    18    28.571429
    19    19.047619
    20    28.571429
    21    23.809524
    22    33.333333
    23    19.047619
    24    33.333333
    dtype: float64
```

the code # n = ((df_m.iloc[:, 1:] <= kk[0.25]).sum(axis=1) / df_m.shape[1]) * 100

print(round(n))

calculates a variable "n"using the dataframe "df_m" and the mean value in "kk" to perform calculations.

```
la = df_m['25qt'] = round(((df_m.iloc[:, 1:] <= kk[0.25]).sum(axis=1) / df_m.shape[1]) * 100,1)
ll = df_m['50qt'] = round(((df_m.iloc[:, 1:] <= kk[0.50]).sum(axis=1) / df_m.shape[1]) * 100,1)
lll = df_m['75qt'] = round(((df_m.iloc[:, 1:] <= kk[0.75]).sum(axis=1) / df_m.shape[1]) * 100,1)
print(la, ll, lll)
```

```
    18    28.6
    19    19.0
    20    28.6
    21    23.8
    22    33.3
    23    19.0
    24    33.3
    dtype: float64 0     55.8
    1     55.8
    2     60.5
    3     51.2
    4     60.5
    5     34.9
    6     55.8
    7     51.2
    8     46.5
    9     48.8
    10    48.8
    11    41.9
    12    53.5
    13    44.2
    14    48.8
    15    41.9
    16    46.5
    17    41.9
    18    55.8
    19    41.9
    20    53.5
    21    51.2
    22    48.8
    23    53.5
    24    67.4
```

```
18    72.7
19    68.2
20    75.0
21    72.7
22    75.0
23    70.5
24    86.4
dtype: float64
```

the code la = df_m['25qt'] = round(((df_m.iloc[:, 1:] <= kk[0.25]).sum(axis=1) / df_m.shape[1]) * 100,1) ll = df_m['50qt'] = round(((df_m.iloc[:, 1:] <= kk[0.50]).sum(axis=1) / df_m.shape[1]) * 100,1) lll = df_m['75qt'] = round(((df_m.iloc[:, 1:] <= kk[0.75]).sum(axis=1) / df_m.shape[1]) * 100,1) calculates the variables "la" "ll" and "lll" using "df_m" and the mean values of "kk".

```
# df_m
```

```
end_set = ['City','25qt','50qt','75qt']
df_m[end_set]
```

	City	25qt	50qt	75qt
0	Birmingham	28.6	55.8	77.3
1	Montgomery	21.4	55.8	70.5
2	Mobile	38.1	60.5	79.5
3	Huntsville	26.2	51.2	77.3
4	Tuscaloosa	21.4	60.5	79.5
5	Hoover	16.7	34.9	59.1
6	Dothan	19.0	55.8	90.9
7	Auburn	23.8	51.2	79.5
8	Decatur	21.4	46.5	70.5
9	Madison	28.6	48.8	75.0
10	Florence	26.2	48.8	63.6
11	Gadsden	19.0	41.9	68.2
12	Vestavia Hills	26.2	53.5	70.5
13	Prattville	23.8	44.2	75.0
14	Phenix City	28.6	48.8	75.0
15	Alabaster	28.6	41.9	84.1
16	Bessemer	14.3	46.5	70.5
17	Enterprise	19.0	41.9	72.7
18	Opelika	28.6	55.8	72.7
19	Homewood	19.0	41.9	68.2
20	Northport	28.6	53.5	75.0
21	Pelham	23.8	51.2	72.7
22	Trussville	33.3	48.8	75.0
23	Mountain Brook	19.0	53.5	70.5
24	Fairhope	33.3	67.4	86.4

the code end_set = ['City','25qt','50qt','75qt'] df_m[end_set] selects a subset of columns from "df_m" and assigns it to a new data frame "end_set"

```
#choropleth:
import pandas as pd

# Create a sample dataframe
```

```
data = {'City': ['Birmingham', 'Montgomery', 'Mobile', 'Huntsville', 'Tuscaloosa', 'Hoover', 'Dothan', 'Auburn', 'Decatur', 'Ma
        'Zip Code': ['35201','36101','36601','35801','35401','35216','36301','36830','35601','35756','35630','35901','35216','3

df = pd.DataFrame(data)

# Create a list of zip codes
zip_codes = ['35201', '36101', '36601', '35801', '35401', '35216',
             '36301', '36830', '35601', '35756', '35630', '35901',
             '35216', '36066', '36867', '35007', '35020',
             '36330', 36801, 35209, 35473, 35124, 35173, 35213, 36532]

# Add the list of zip codes as a new column to the dataframe
# df = df.assign(Zip_Codes=zip_codes)
df_m = df_m.assign(zip=zip_codes)


print(df_m)
```

```
              City     1     2     3     4     5     6     7     8     9  ...  \
0       Birmingham  8285  5343  6738  6635  5658  8118  4311  8535  3436  ...   
1       Montgomery  1287  6585  8300  8874  8208  5363  3552  3387  2765  ...   
2           Mobile  8035  5569  9492  5905  5024  1107  6937  5580  8044  ...   
3       Huntsville  6280  2841  3399  5448  6173  5451  7488  9981  5236  ...   
4       Tuscaloosa  4079  1066  3923  4177  4277  4219  9436  8160  4302  ...   
5           Hoover  9741  7377  9410  9790  8864  2522  5347  9145  8402  ...   
6           Dothan  7646  2060  4911  4976  7851  4277  7423  6183  6641  ...   
7           Auburn  4326  2659  6928  4656  1828  5199  5331  6294  3076  ...   
8          Decatur  3786  2891  8124  2469  3704  3623  2409  8287  2032  ...   
9          Madison  1934  3628  9190  3275  9344  5778  1256  3523  1781  ...   
10        Florence  8017  3187  1128  4706  9962  7547  4440  4530  9569  ...   
11         Gadsden  2290  6402  8598  7547  5158  9731  8038  4435  7357  ...   
12  Vestavia Hills  9471  9142  4419  3846  2016  5069  4853  6336  9062  ...   
13      Prattville  6039  8003  6180  4610  3548  7115  6720  8512  9954  ...   
14    Phenix City  8788  8269  6838  2863  6753  6608  4048  8774  4513  ...   
15       Alabaster  1733  9767  3274  7125  7437  5748  5399  6513  3038  ...   
16        Bessemer  6559  2453  1578  5158  3058  8075  7066  8530  8346  ...   
17      Enterprise  8436  7800  7234  5063  4274  1948  7887  6647  1320  ...   
18         Opelika  9998  8953  7923  6176  4369  9503  2126  1816  9224  ...   
19        Homewood  2373  7188  9880  9236  5969  9998  8703  8440  4643  ...   
20       Northport  3536  9231  8651  6374  4842  5704  8484  6322  2012  ...   
21          Pelham  6830  3736  2734  6443  8494  6206  7290  8518  6176  ...   
22     Trussville  2794  8273  9174  2850  8351  3978  5995  4632  7693  ...   
23  Mountain Brook  8433  9368  2141  2357  6566  1482  4787  3900  6615  ...   
24       Fairhope  8114  1464  2811  3090  4686  7995  7676  1304  7332  ...   

      36    37    38    39    40    41  25qt  50qt  75qt    zip  
0   3555  1341  1756  7598  1509  1861  28.6  55.8  77.3  35201  
1   2805  4601  4449  5727  2315  8822  21.4  55.8  70.5  36101  
2   9807  2652  9296  2815  4886  7458  38.1  60.5  79.5  36601  
3   7935  2605  9982  3338  9116  3875  26.2  51.2  77.3  35801  
4   3657  2158  4469  2513  8135  6963  21.4  60.5  79.5  35401  
5   9748  7224  4628  8107  6143  1671  16.7  34.9  59.1  35216  
6   5650  4400  7842  4006  9335  3571  19.0  55.8  90.9  36301  
7   4387  6890  2833  5083  9707  2116  23.8  51.2  79.5  36830  
8   9305  6509  6848  5408  3707  8744  21.4  46.5  70.5  35601  
9   1746  4470  7054  6573  3556  1374  28.6  48.8  75.0  35756  
10  5929  1123  7306  8746  4000  6943  26.2  48.8  63.6  35630  
11  2549  5175  5997  9608  7230  9731  19.0  41.9  68.2  35901  
12  5142  9619  9601  8099  1391  6276  26.2  53.5  70.5  35216  
13  1591  4401  3457  4245  4341  2573  23.8  44.2  75.0  36066  
14  3520  7654  6845  7738  3828  1202  28.6  48.8  75.0  36867  
15  2479  9673  7478  7207  7006  3523  28.6  41.9  84.1  35007  
16  4810  7641  5365  3545  6812  9483  14.3  46.5  70.5  35020  
17  3461  2640  4375  8634  4917  2830  19.0  41.9  72.7  36330  
18  5191  9304  2720  3100  3912  1548  28.6  55.8  72.7  36801  
19  8787  5459  8389  5242  2224  6025  19.0  41.9  68.2  35209  
20  6947  5401  6681  9018  1668  8307  28.6  53.5  75.0  35473  
21  2777  4045  7309  4745  4284  2640  23.8  51.2  72.7  35124  
22  1650  9470  6356  4700  3344  8743  33.3  48.8  75.0  35173  
23  5765  3653  5198  9266  4945  3935  19.0  53.5  70.5  35213  
24  3457  4808  7227  5482  6355  4553  33.3  67.4  86.4  36532  

[25 rows x 46 columns]
```

this code demonstrates how to use pandas to create a sample dataframe, add a new column, and print the results.

```
df_m.columns
```

```
    Index(['City', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12',
           '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24',
           '25', '26', '27', '28', '29', '30', '31', '32', '33', '34', '35', '36',
           '37', '38', '39', '40', '41', '25qt', '50qt', '75qt', 'zip'],
          dtype='object')
```

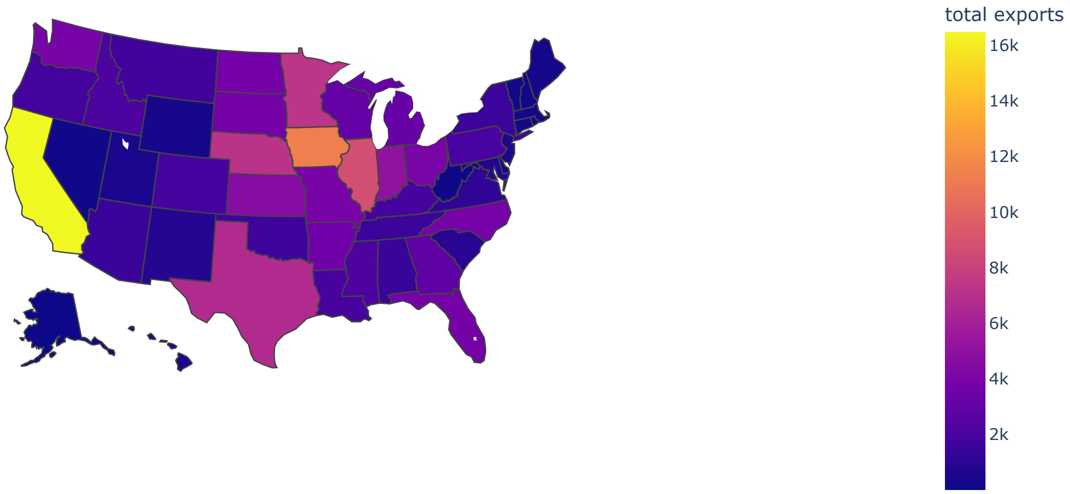
this code returns the column labels of the dataframe as a pandas index object This property can be used to access or manipulate the column labels of the DataFrame.

```
import plotly.express as px
import pandas as pd

# Load data
df_demo = pd.read_csv('https://raw.githubusercontent.com/plotly/datasets/master/2011_us_ag_exports.csv')

# Create choropleth map
fig = px.choropleth(df_demo, locations='code', locationmode='USA-states', color='total exports', scope='usa')

# Show map
fig.show()
```



this code demonstrates how to create a choropleth map using Plotly Express library in python

```
df_demo
```

	code	state	category	total exports	beef	pork	poultry	dairy	fruits fresh	fruits proc	total fruits	veggies
0	AL	Alabama	state	1390.63	34.4	10.6	481.0	4.06	8.0	17.1	25.11	
1	AK	Alaska	state	13.31	0.2	0.1	0.0	0.19	0.0	0.0	0.00	
2	AZ	Arizona	state	1463.17	71.3	17.9	0.0	105.48	19.3	41.0	60.27	
3	AR	Arkansas	state	3586.02	53.2	29.4	562.9	3.53	2.2	4.7	6.88	
4	CA	California	state	16472.88	228.7	11.1	225.4	929.95	2791.8	5944.6	8736.40	
5	CO	Colorado	state	1851.33	261.4	66.0	14.0	71.94	5.7	12.2	17.99	
6	CT	Connecticut	state	259.62	1.1	0.1	6.9	9.49	4.2	8.9	13.10	
7	DE	Delaware	state	282.19	0.4	0.6	114.7	2.30	0.5	1.0	1.53	
8	FL	Florida	state	3764.09	42.6	0.9	56.9	66.31	438.2	933.1	1371.36	
9	GA	Georgia	state	2860.84	31.0	18.9	630.4	38.38	74.6	158.9	233.51	
10	HI	Hawaii	state	401.84	4.0	0.7	1.3	1.16	17.7	37.8	55.51	
11	ID	Idaho	state	2078.89	119.8	0.0	2.4	294.60	6.9	14.7	21.64	
12	IL	Illinois	state	8709.48	53.7	394.0	14.0	45.82	4.0	8.5	12.53	
13	IN	Indiana	state	5050.23	21.9	341.9	165.6	89.70	4.1	8.8	12.98	
14	IA	Iowa	state	11273.76	289.8	1895.6	155.6	107.00	1.0	2.2	3.24	
15	KS	Kansas	state	4589.01	659.3	179.4	6.4	65.45	1.0	2.1	3.11	
16	KY	Kentucky	state	1889.15	54.8	34.2	151.3	28.27	2.1	4.5	6.60	
17	LA	Louisiana	state	1914.23	19.8	0.8	77.2	6.02	5.7	12.1	17.83	
18	ME	Maine	state	278.37	1.4	0.5	10.4	16.18	16.6	35.4	52.01	
19	MD	Maryland	state	692.75	5.6	3.1	127.0	24.81	4.1	8.8	12.90	
20	MA	Massachusetts	state	248.65	0.6	0.5	0.6	5.81	25.8	55.0	80.83	
21	MI	Michigan	state	3164.16	37.7	118.1	32.6	214.82	82.3	175.3	257.69	
22	MN	Minnesota	state	7192.33	112.3	740.4	189.2	218.05	2.5	5.4	7.91	
23	MS	Mississippi	state	2170.80	12.8	30.4	370.8	5.45	5.4	11.6	17.04	
24	MO	Missouri	state	3933.42	137.2	277.3	196.1	34.26	4.2	9.0	13.18	
25	MT	Montana	state	1718.00	105.0	16.7	1.7	6.82	1.1	2.2	3.30	
26	NE	Nebraska	state	7114.13	762.2	262.5	31.4	30.07	0.7	1.5	2.16	
27	NV	Nevada	state	139.89	21.8	0.2	0.0	16.57	0.4	0.8	1.19	
28	NH	New Hampshire	state	73.06	0.6	0.2	0.8	7.46	2.6	5.4	7.98	
29	NJ	New Jersey	state	500.40	0.8	0.4	4.6	3.37	35.0	74.5	109.45	
30	NM	New Mexico	state	751.58	117.2	0.1	0.3	191.01	32.6	69.3	101.90	
31	NY	New York	state	1488.90	22.2	5.8	17.7	331.80	64.7	137.8	202.56	
32	NC	North Carolina	state	3806.05	24.8	702.8	598.4	24.90	23.8	50.7	74.47	
33	ND	North Dakota	state	3761.96	78.5	16.1	0.5	8.14	0.1	0.2	0.25	
34	OH	Ohio	state	3979.79	36.2	199.1	129.9	134.57	8.7	18.5	27.21	
35	OK	Oklahoma	state	1646.41	337.6	265.3	131.1	24.35	3.0	6.3	9.24	
36	OR	Oregon	state	1794.57	58.8	1.4	14.2	63.66	100.7	214.4	315.04	
37	PA	Pennsylvania	state	1969.87	50.9	91.3	169.8	280.87	28.6	60.9	89.48	
38	RI	Rhode Island	state	31.59	0.1	0.1	0.2	0.52	0.9	1.9	2.83	
39	SC	South Carolina	state	929.93	15.2	10.9	186.5	7.62	17.1	36.4	53.45	
40	SD	South Dakota	state	3770.19	193.5	160.2	29.3	46.77	0.3	0.5	0.80	
41	TN	Tennessee	state	1535.13	51.1	17.6	82.4	21.18	2.0	4.2	6.23	
42	TX	Texas	state	6648.22	961.0	42.7	339.2	240.55	31.9	68.0	99.90	
43	UT	Utah	state	453.39	27.9	59.0	23.1	48.60	3.9	8.4	12.34	
45	VA	Virginia	state	1146.48	39.5	16.9	164.7	47.85	11.7	24.8	36.48	

this variable represents a pandas dataframe. the CSV file contains data related to US agricultural exports.

```
   47    WV    West Virginia    state    128.80   12.0   0.2   45.4   3.90   2.7   7.0   11.54
```

```
df_demo.columns
```

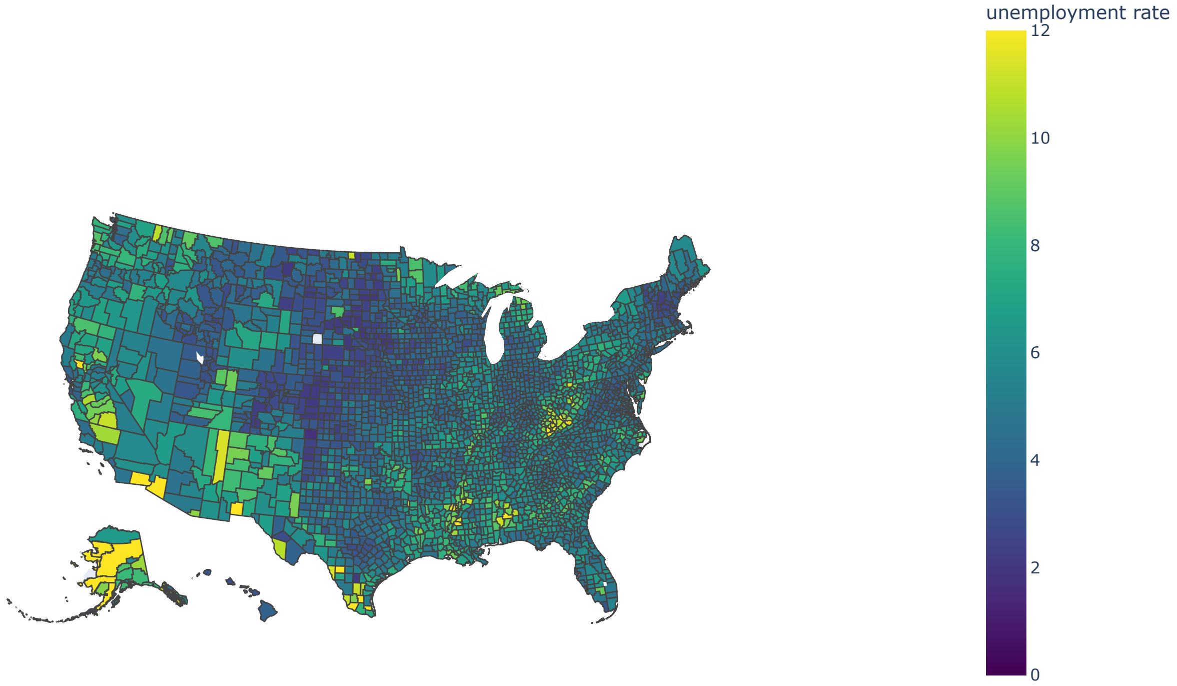
```
    Index(['code', 'state', 'category', 'total exports', 'beef', 'pork', 'poultry',
           'dairy', 'fruits fresh', 'fruits proc', 'total fruits', 'veggies fresh',
           'veggies proc', 'total veggies', 'corn', 'wheat', 'cotton'],
          dtype='object')
```

```
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)

import pandas as pd
df_us = pd.read_csv("https://raw.githubusercontent.com/plotly/datasets/master/fips-unemp-16.csv",
                   dtype={"fips": str})

import plotly.express as px

fig = px.choropleth(df_us, 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()
```



this code demonstrates how to create a choropleth map using country level data from a URL.

```
df_us.columns
```

```
    Index(['fips', 'unemp'], dtype='object')
```

```
df_us
```

	fips	unemp
0	01001	5.3
1	01003	5.4
2	01005	8.6
3	01007	6.6
4	01009	5.5
...	...	...
3214	72145	13.9
3215	72147	10.6
3216	72149	20.2

```
al_fips =[
    {'County': 'Autauga', 'FIPS Code': '01001'},
    {'County': 'Baldwin', 'FIPS Code': '01003'},
    {'County': 'Barbour', 'FIPS Code': '01005'},
    {'County': 'Bibb', 'FIPS Code': '01007'},
    {'County': 'Blount', 'FIPS Code': '01009'},
    {'County': 'Bullock', 'FIPS Code': '01011'},
    {'County': 'Butler', 'FIPS Code': '01013'},
    {'County': 'Calhoun', 'FIPS Code': '01015'},
    {'County': 'Chambers', 'FIPS Code': '01017'},
    {'County': 'Cherokee', 'FIPS Code': '01019'},
    {'County': 'Chilton', 'FIPS Code': '01021'},
    {'County': 'Choctaw', 'FIPS Code': '01023'},
    {'County': 'Clarke', 'FIPS Code': '01025'},
    {'County': 'Clay', 'FIPS Code': '01027'},
    {'County': 'Cleburne', 'FIPS Code': '01029'},
    {'County': 'Coffee', 'FIPS Code': '01031'},
    {'County': 'Colbert', 'FIPS Code': '01033'},
    {'County': 'Conecuh', 'FIPS Code': '01035'},
    {'County':'Greene', 'FIPS Code' : '28073'},
    {'County':'Hale', 'FIPS Code' : '28065'},
    {'County':'Henry','FIPS Code' : '28067'},
    {'County':'Houston', 'FIPS Code' : '28069'},
    {'County':'Jackson', 'FIPS Code' : '28071'},
    {'County':'Jefferson', 'FIPS Code' : '28073'},
    {'County':'Lamar', 'FIPS Code' : '28073'}]
len(al_fips)
```

```
25
```

this code provides a list of defined dictionaries called "al_flips" and each dictionary represents a country in the state of alabama.

```
df_m.columns
```

```
Index(['City', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12',
       '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24',
       '25', '26', '27', '28', '29', '30', '31', '32', '33', '34', '35', '36',
       '37', '38', '39', '40', '41', '25qt', '50qt', '75qt', 'zip'],
      dtype='object')
```

```
df_m
```

	City	1	2	3	4	5	6	7	8	9	...	36	37	38	39	40	41	25qt	50qt	75qt	zip
0	Birmingham	8285	5343	6738	6635	5658	8118	4311	8535	3436	...	3555	1341	1756	7598	1509	1861	28.6	55.8	77.3	35201
1	Montgomery	1287	6585	8300	8874	8208	5363	3552	3387	2765	...	2805	4601	4449	5727	2315	8822	21.4	55.8	70.5	36101
2	Mobile	8035	5569	9492	5905	5024	1107	6937	5580	8044	...	9807	2652	9296	2815	4886	7458	38.1	60.5	79.5	36601
3	Huntsville	6280	2841	3399	5448	6173	5451	7488	9981	5236	...	7935	2605	9982	3338	9116	3875	26.2	51.2	77.3	35801
4	Tuscaloosa	4079	1066	3923	4177	4277	4219	9436	8160	4302	...	3657	2158	4469	2513	8135	6963	21.4	60.5	79.5	35401
5	Hoover	9741	7377	9410	9790	8864	2522	5347	9145	8402	...	9748	7224	4628	8107	6143	1671	16.7	34.9	59.1	35216
6	Dothan	7646	2060	4911	4976	7851	4277	7423	6183	6641	...	5650	4400	7842	4006	9335	3571	19.0	55.8	90.9	36301
7	Auburn	4326	2659	6928	4656	1828	5199	5331	6294	3076	...	4387	6890	2833	5083	9707	2116	23.8	51.2	79.5	36830
8	Decatur	3786	2891	8124	2469	3704	3623	2409	8287	2032	...	9305	6509	6848	5408	3707	8744	21.4	46.5	70.5	35601
9	Madison	1934	3628	9190	3275	9344	5778	1256	3523	1781	...	1746	4470	7054	6573	3556	1374	28.6	48.8	75.0	35756
10	Florence	8017	3187	1128	4706	9962	7547	4440	4530	9569	...	5929	1123	7306	8746	4000	6943	26.2	48.8	63.6	35630
11	Gadsden	2290	6402	8598	7547	5158	9731	8038	4435	7357	...	2549	5175	5997	9608	7230	9731	19.0	41.9	68.2	35901
12	Vestavia Hills	9471	9142	4419	3846	2016	5069	4853	6336	9062	...	5142	9619	9601	8099	1391	6276	26.2	53.5	70.5	35216
13	Prattville	6039	8003	6180	4610	3548	7115	6720	8512	9954	...	1591	4401	3457	4245	4341	2573	23.8	44.2	75.0	36066
14	Phenix City	8788	8269	6838	2863	6753	6608	4048	8774	4513	...	3520	7654	6845	7738	3828	1202	28.6	48.8	75.0	36867
15	Alabaster	1733	9767	3274	7125	7437	5748	5399	6513	3038	...	2479	9673	7478	7207	7006	3523	28.6	41.9	84.1	35007
16	Bessemer	6559	2453	1578	5158	3058	8075	7066	8530	8346	...	4810	7641	5365	3545	6812	9483	14.3	46.5	70.5	35020
17	Enterprise	8436	7800	7234	5063	4274	1948	7887	6647	1320	...	3461	2640	4375	8634	4917	2830	19.0	41.9	72.7	36330
18	Opelika	9998	8953	7923	6176	4369	9503	2126	1816	9224	...	5191	9304	2720	3100	3912	1548	28.6	55.8	72.7	36801
19	Homewood	2373	7188	9880	9236	5969	9998	8703	8440	4643	...	8787	5459	8389	5242	2224	6025	19.0	41.9	68.2	35209

```
df_m.shape[0]
```

```
25
```

22	Trussville	2794	8273	9174	2850	8351	3978	5995	4632	7693	...	1650	9470	6356	4700	3344	8743	33.3	48.8	75.0	35173

df_m.shape[0] is a variable representing a pandas dataframe. by evaluating this variable you can identify the count of rows or the total number of records in the data frame "df_m"

```
print(len(al_fips))
df_counties = pd.DataFrame(al_fips)
df_counties.size
```

```
25
50
```

this code prints the lenght of the list "al_flips" and will output the number of elements present in the list.

```
print(df_counties.columns)
```

```
Index(['County', 'FIPS Code'], dtype='object')
```

this code prints out the contents of the "countries" column

```
df_m.shape[0]
```

```
25
```

this snippet is a pandas dataframe

```
df_counties.shape[0]
```

```
25
```

```
df_counties.columns
```

```
Index(['County', 'FIPS Code'], dtype='object')
```

this code returns a pandas index object that represents the column labels of the data frame "ds_countries"

```
merged_df = pd.concat([df_m, df_counties], axis=1)
merged_df.head()
```

	City	1	2	3	4	5	6	7	8	9	...	38	39	40	41	25qt	50qt	75qt	zip	County	FIPS
0	Birmingham	8285	5343	6738	6635	5658	8118	4311	8535	3436	...	1756	7598	1509	1861	28.6	55.8	77.3	35201	Autauga	
1	Montgomery	1287	6585	8300	8874	8208	5363	3552	3387	2765	...	4449	5727	2315	8822	21.4	55.8	70.5	36101	Baldwin	
2	Mobile	8035	5569	9492	5905	5024	1107	6937	5580	8044	...	9296	2815	4886	7458	38.1	60.5	79.5	36601	Barbour	
3	Huntsville	6280	2841	3399	5448	6173	5451	7488	9981	5236	...	9982	3338	9116	3875	26.2	51.2	77.3	35801	Bibb	
4	Tuscaloosa	4079	1066	3923	4177	4277	4219	9436	8160	4302	...	4469	2513	8135	6963	21.4	60.5	79.5	35401	Blount	

5 rows × 48 columns

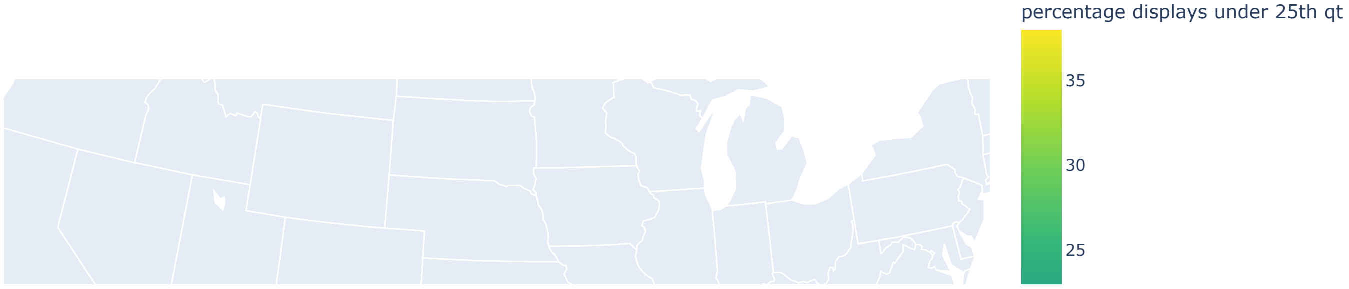
this code is used to concatenate the two data frames horizontally meaning they are merged side to side along the columns.

```
merged_df.columns
```

```
Index(['City', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12',
       '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24',
       '25', '26', '27', '28', '29', '30', '31', '32', '33', '34', '35', '36',
       '37', '38', '39', '40', '41', '25qt', '50qt', '75qt', 'zip', 'County',
       'FIPS Code'],
      dtype='object')
```

```
import plotly.express as px

fig = px.choropleth(merged_df, geojson=counties, locations='FIPS Code', color='25qt',
                           color_continuous_scale="Viridis",
                           range_color=(0, 38),
                           scope="usa",
                    hover_name="City",
                    hover_data=["City"],
                           labels={'25qt':'percentage displays under 25th qt'}  #
                          )
fig.update_layout(margin={"r":0,"t":0,"l":0,"b":0})
fig.show()
```



this code creates a choropleth map of a specific area

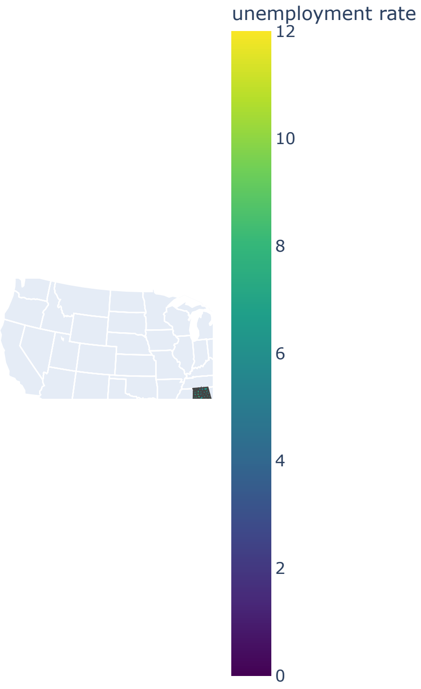
```
import plotly.express as px
import requests
import json
import pandas as pd

# Load the geojson data for Alabama's counties
r = requests.get('https://raw.githubusercontent.com/plotly/datasets/master/geojson-counties-fips.json')
counties = json.loads(r.text)

# Filter the geojson data to only include Alabama's counties
target_states = ['01']
counties['features'] = [f for f in counties['features'] if f['properties']['STATE'] in target_states]

# Load the sample data for Alabama's counties
df = pd.read_csv('https://raw.githubusercontent.com/plotly/datasets/master/fips-unemp-16.csv', dtype={'fips': str})

# Create the choropleth map
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()
```



this code demonstrates the use of plotly express inside python to create a choropleth map of the unemployment rate in alabamas counties.

Start coding or generate with AI.