Th

written material

going to grab this data from gh: https://raw.githubusercontent.com/stefanbund/py3100/main/ProductList_118.csv

The Ulta Beauty Problem

our work entails designing and delivering a business intelligence application that serves a major retail enterprise. The system ....

first, install the plotly visualization library.

```
!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 45.8 MB/s eta 0:00:00
Installing collected packages: plotly-geo
Successfully installed plotly-geo-1.0.0
```

Double-click (or enter) to edit

our system depends on the use of the pandas and numpy libraries.

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

This is the link where we link URL with a object name URL_m with the csv file and colab can get from github.

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

we name df_m and use the pandas library to read our url file from github.

```
df_m = pd.read_csv(url_m) #make a pandas dataframe
```

Here we call the name and colab displays our csv file with the relevent data.

```
df_m
```

	City	1	2	3	4	5	6	7	8	9	...	32	33	
0	Birmingham	8285	5343	6738	6635	5658	8118	4311	8535	3436	...	1340	6923	30
1	Montgomery	1287	6585	8300	8874	8208	5363	3552	3387	2765	...	4424	8813	66
2	Mobile	8035	5569	9492	5905	5024	1107	6937	5580	8044	...	5430	1601	9
3	Huntsville	6280	2841	3399	5448	6173	5451	7488	9981	5236	...	9169	7829	68
4	Tuscaloosa	4079	1066	3923	4177	4277	4219	9436	8160	4302	...	1556	5533	18
5	Hoover	9741	7377	9410	9790	8864	2522	5347	9145	8402	...	6031	7673	84
6	Dothan	7646	2060	4911	4976	7851	4277	7423	6183	6641	...	8253	1565	60
7	Auburn	4326	2659	6928	4656	1828	5199	5331	6294	3076	...	6128	3737	77
8	Decatur	3786	2891	8124	2469	3704	3623	2409	8287	2032	...	6622	9742	93
9	Madison	1934	3628	9190	3275	9344	5778	1256	3523	1781	...	6619	6128	53
10	Florence	8017	3187	1128	4706	9962	7547	4440	4530	9569	...	8306	1392	13
11	Gadsden	2290	6402	8598	7547	5158	9731	8038	4435	7357	...	4488	3591	16

We are now using a syntax in python to label the colums of the csv file.

```
df_m.columns #dimensionality of the matrix
```

```
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')
```

list all cities in the matrix dataframe i think this links to the previous columns and gives them labels with city names.

```
df_m['City'] #explore a Series inside the dataframe
```

```
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
```

investigate quartile as an analytic tool, we are labeling the object to be a 64 bit integer.

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

```
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
```

Quantiles for each display, all stores

Here we use dataframe with the name df_3 and the syntax quantile of 25% 50% and 75% of our dataframe. then we call and display the dataframe.

```
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	...	
0.25	3082.0	3633.0	2236.0	3473.0	3657.0	4628.0	4254.0	3588.0	3704.0	3451.0	...	344
0.50	5343.0	5431.0	5311.0	5771.0	5131.0	7588.0	5156.0	5331.0	6589.0	5875.0	...	647
0.75	7242.0	8074.0	7508.0	7935.0	7490.0	9145.0	6840.0	7606.0	8221.0	7783.0	...	743

Here we call for the dataframe and transpose the columns with the rolls. using df_3.T, then we give the transposed dataframe a new name named l. Also l can be with decimals using a float64 dtype.

Double-click (or enter) to edit

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

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

we get the means of the transposed data.

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

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

define the global quartile boundary, per q

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

```
3535.24
```

in this comand we look at the transposed dataframe and spcifically look at the 50% column and take the mean of that column.

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

```
5826.36
```

Double-click (or enter) to edit

in this comand we look at the transposed dataframe and spcifically look at the 75% column and take the mean of that column.

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

```
7953.0
```

Double-click (or enter) to edit

in this command we take the mean of the whole dataframe of all the columns of 25% 50% and 75% and get the mean of each.

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

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

here we take the dataframe and turn it into a boolean dataframe where it sums up the number of true values where it calculates all the 25% that are less or equal to, then calculates the percentage of that the true values. and rounds it it to the nearest percentage.

```
# 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
```

here we label the 25% 50% and 75% of the lowest performing stands and print the percentage of each using la, ll and lll as names for each quartile.

```
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
dtype: float64 0     77.3
1     70.5
2     79.5
3     77.3
4     79.5
5     59.1
6     90.9
7     79.5
8     70.5
9     75.0
10    63.6
11    68.2
12    70.5
13    75.0
14    75.0
15    84.1
16    70.5
17    72.7
18    72.7
19    68.2
20    75.0
21    72.7
22    75.0
23    70.5
24    86.4
dtype: float64
```

```
# df_m
```

we label the rows of the dataframe with name of the city, 25%, 50% and 75% quartile.

```
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

create a choropleth for each store

[illegible]	Trussville	[illegible]	[illegible]	[illegible]

In order to create our choropleth, we need to label each city with numbers and here we chose to use "zip codes" and label each city with the corresponding zip code.

```
#choropleth:
import pandas as pd

# Create a sample dataframe
data = {'City': ['Birmingham', 'Montgomery', 'Mobile', 'Huntsville', 'Tuscaloosa', 'Hoover', 'Dothan', 'Auburn', 'Decatur', 'Madison', 'Flore
        'Zip Code': ['35201','36101','36601','35801','35401','35216','36301','36830','35601','35756','35630','35901','35216','36066','36867',

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]
```

experiment with chloropleths

here we assign the stands with numbers 1-41 along with also their 25, 50 75 quartile and the zipcode.

```
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')
```

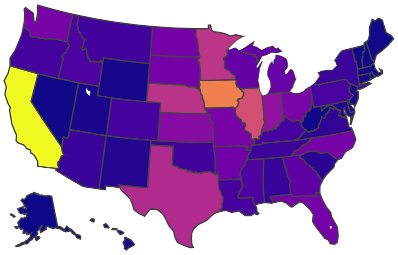
here we using plotly express for the purpose of a choropleth map. we import the csv file from gibhub with the url and name it df_demo and read with pandas. from there we create a object name fig and use the command px.choropleth and the parameters to indicate that it is using the a map of US and the code is the zip codes.

```
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()
```



df_demo calls the dataframe table we have with all the imports we talked about in class.

```
df_demo
```

	code	state	category	total exports	beef	pork	poultry	dairy	fruits fresh	f
0	AL	Alabama	state	1390.63	34.4	10.6	481.0	4.06	8.0	
1	AK	Alaska	state	13.31	0.2	0.1	0.0	0.19	0.0	
2	AZ	Arizona	state	1463.17	71.3	17.9	0.0	105.48	19.3	
3	AR	Arkansas	state	3586.02	53.2	29.4	562.9	3.53	2.2	
4	CA	California	state	16472.88	228.7	11.1	225.4	929.95	2791.8	5
5	CO	Colorado	state	1851.33	261.4	66.0	14.0	71.94	5.7	
6	CT	Connecticut	state	259.62	1.1	0.1	6.9	9.49	4.2	
7	DE	Delaware	state	282.19	0.4	0.6	114.7	2.30	0.5	
8	FL	Florida	state	3764.09	42.6	0.9	56.9	66.31	438.2	
9	GA	Georgia	state	2860.84	31.0	18.9	630.4	38.38	74.6	
10	HI	Hawaii	state	401.84	4.0	0.7	1.3	1.16	17.7	
11	ID	Idaho	state	2078.89	119.8	0.0	2.4	294.60	6.9	
12	IL	Illinois	state	8709.48	53.7	394.0	14.0	45.82	4.0	
13	IN	Indiana	state	5050.23	21.9	341.9	165.6	89.70	4.1	
14	IA	Iowa	state	11273.76	289.8	1895.6	155.6	107.00	1.0	
15	KS	Kansas	state	4589.01	659.3	179.4	6.4	65.45	1.0	
16	KY	Kentucky	state	1889.15	54.8	34.2	151.3	28.27	2.1	
17	LA	Louisiana	state	1914.23	19.8	0.8	77.2	6.02	5.7	
18	ME	Maine	state	278.37	1.4	0.5	10.4	16.18	16.6	
19	MD	Maryland	state	692.75	5.6	3.1	127.0	24.81	4.1	
20	MA	Massachusetts	state	248.65	0.6	0.5	0.6	5.81	25.8	
21	MI	Michigan	state	3164.16	37.7	118.1	32.6	214.82	82.3	
22	MN	Minnesota	state	7192.33	112.3	740.4	189.2	218.05	2.5	

we label the columns of our dataframe.

24 MO Missouri state 3933.42 137.2 277.3 196.1 34.26 4.2

```
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')
```

Hampshire

map demo #2: state of AL we use json to load the github file and also to pass as an argument as counties in the choropleth. we import the csv file and fips is used as a string I'm guessing because its better displayed on the choropleth map. then we use the px.choropleth command with the parameters to fill the map with data that we loaded from the csv and json.

```
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()
```

```
df_us.columns
```

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

this command calls the fips in the dataframe df.

```
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
3217	72151	16.9
3218	72153	18.8

3219 rows × 2 columns

documentation here, with more discusssion here, and specifially to do counties, here

county **list** for ulta stores in Alabama, by FIPS code

this is all the counties that have ulta stores and we label each county but their fips code and also the zip code.

```
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
```

not sure why we are calling the dataframe with columns again.

```
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')
```

we call the dataframe again.

```
df_m
```

	City	1	2	3	4	5	6	7	8	9	...	36	37	
0	Birmingham	8285	5343	6738	6635	5658	8118	4311	8535	3436	...	3555	1341	17
1	Montgomery	1287	6585	8300	8874	8208	5363	3552	3387	2765	...	2805	4601	44
2	Mobile	8035	5569	9492	5905	5024	1107	6937	5580	8044	...	9807	2652	92
3	Huntsville	6280	2841	3399	5448	6173	5451	7488	9981	5236	...	7935	2605	99
4	Tuscaloosa	4079	1066	3923	4177	4277	4219	9436	8160	4302	...	3657	2158	44
5	Hoover	9741	7377	9410	9790	8864	2522	5347	9145	8402	...	9748	7224	46
6	Dothan	7646	2060	4911	4976	7851	4277	7423	6183	6641	...	5650	4400	78
7	Auburn	4326	2659	6928	4656	1828	5199	5331	6294	3076	...	4387	6890	28

here we call to the first column of the dataframe with the command df_m.shape[0] where 0 is the first.

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

```
25
```

transform al_fips, the list of county fps codes, into a pandas dataframe

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

```
25
50
```

we print the the counties in the dataframe were we put all the fips in

19	Homewood	2373	7188	9880	9236	5969	9998	8703	8440	4643	...	8787	5459	83

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

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

df_m: all display data, per store

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

```
25
```

fips codes per county

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

```
25
```

```
df_counties.columns
```

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

merge the county fips codes with the stores sales results (df_m)

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

use the merged_df as data source for the choropleth

```
0   Birmingham   8285   5343   6738   6635   5658   8118   4311   8535   3436   ...   1756   7598   15(
```

```
merged_df.columns
```

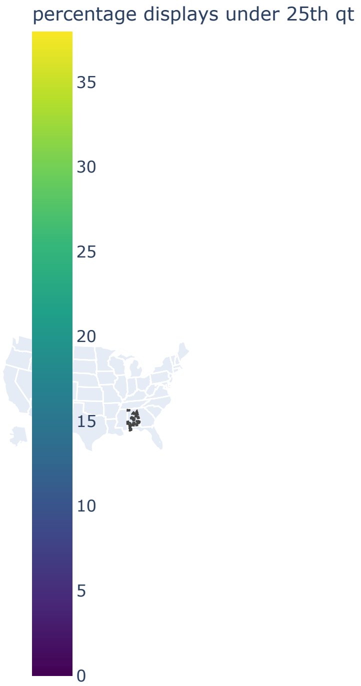
```
     Index(['City', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12',
            '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24',
            '25', '26', '27', '28', '29', '30', '31', '32', '33', '34', '35', '36',
            '37', '38', '39', '40', '41', '25qt',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

Double-click (or enter) to edit

use the plotly api, feed it the merged_df information to do a map, with encoded quantile values

```
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()
```



In these lines of code we are targeting a specific state 01 which is alabama in the csv dataframe which is loaded as a json file. we use the choropleth command again to display only alabama which we specified in the target_states argument.

```
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()
```