DSC 640: Data Presentation & Visualization - Winter 2023

WEEKS 7-8 Exercises: Scatterplots, Bubble Charts, & Density Plots/Maps (PYTHON)

Importing Libraries.

```
In [1]:
import os
 import pandas as pd
import numpy as np
import seaborn as sns
 import matplotlib.pyplot as plt
import plotly.express as px
 import warnings
warnings.filterwarnings('ignore')
# nltk.download('example')
 # pip install squarify
```

crime_df = pd.read_csv('/Users/aaronbrown/Documents/Classwork/DSC 640 - Data Presentation and Visualization/Data/crimerates-by-state-2005.csv')

crime_data = crime_df

crime_data.head(3)

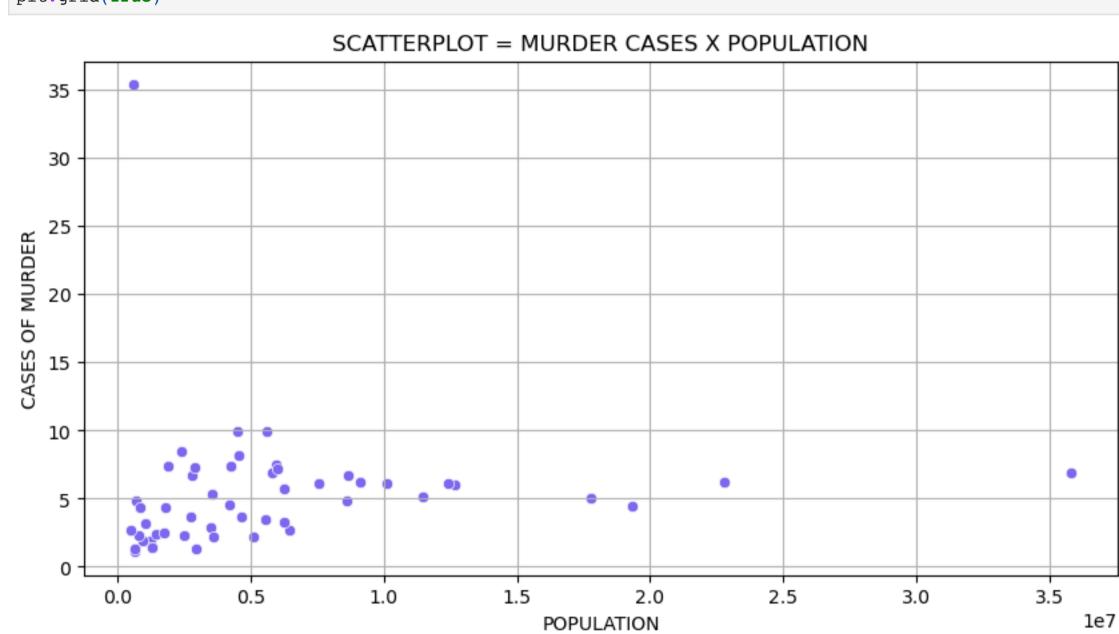
Out[3]: state murder forcible_rape robbery aggravated_assault burglary larceny_theft motor_vehicle_theft population 416.7 295753151 0 United States 5.6 31.7 140.7 291.1 726.7 2286.3 4545049 Alabama 8.2 34.3 141.4 247.8 953.8 2650.0 288.3 2 Alaska 4.8 81.1 80.9 465.1 622.5 2599.1 391.0 669488

In [4]: crime_data = crime_data.drop([0])

Produce: 1 Scatterplot, 1 Bubble Chart and 1 Density Plot Chart Using Python.

Generating Scatterplot.

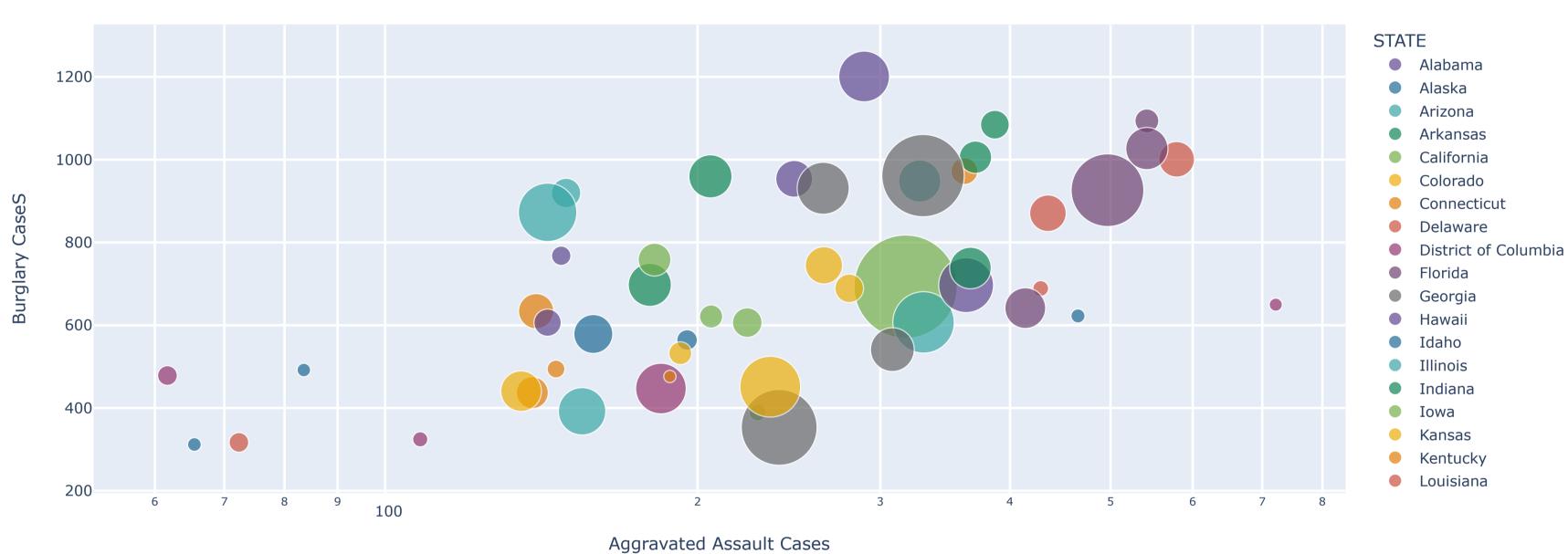
```
In [5]: plt.figure(figsize = (10,5))
plt.title("SCATTERPLOT = MURDER CASES X POPULATION")
plt.xlabel("POPULATION")
plt.ylabel("CASES OF MURDER")
sns.scatterplot(x = crime_data['population'], y = crime_data['murder'], color='mediumslateblue')
plt.grid(True)
```



Generating Bubble Chart.

```
In [6]: fig = px.scatter(x = crime_data['aggravated_assault'], y = crime_data['burglary'],
                  size = crime_data["population"], color = crime_data["state"],
                 hover_name = crime_data["state"], log_x = True, size_max = 60,
                 color_discrete_sequence = px.colors.qualitative.Prism)
fig.update_layout(
    title = 'BUBBLE CHART - AGGRAVATED ASSAULT VS BURGLARY (2005)',
    legend title text = 'STATE',
    xaxis = dict(
        title = 'Aggravated Assault Cases',
        gridcolor = 'white',
        type = 'log',
        gridwidth = 2,
    ),
    yaxis = dict(
        title = 'Burglary CaseS',
        gridcolor = 'white',
        gridwidth = 2,
    ))
fig.show()
```

BUBBLE CHART - AGGRAVATED ASSAULT VS BURGLARY (2005)

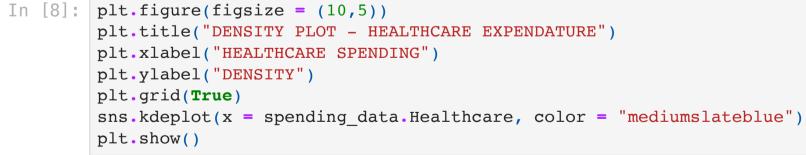


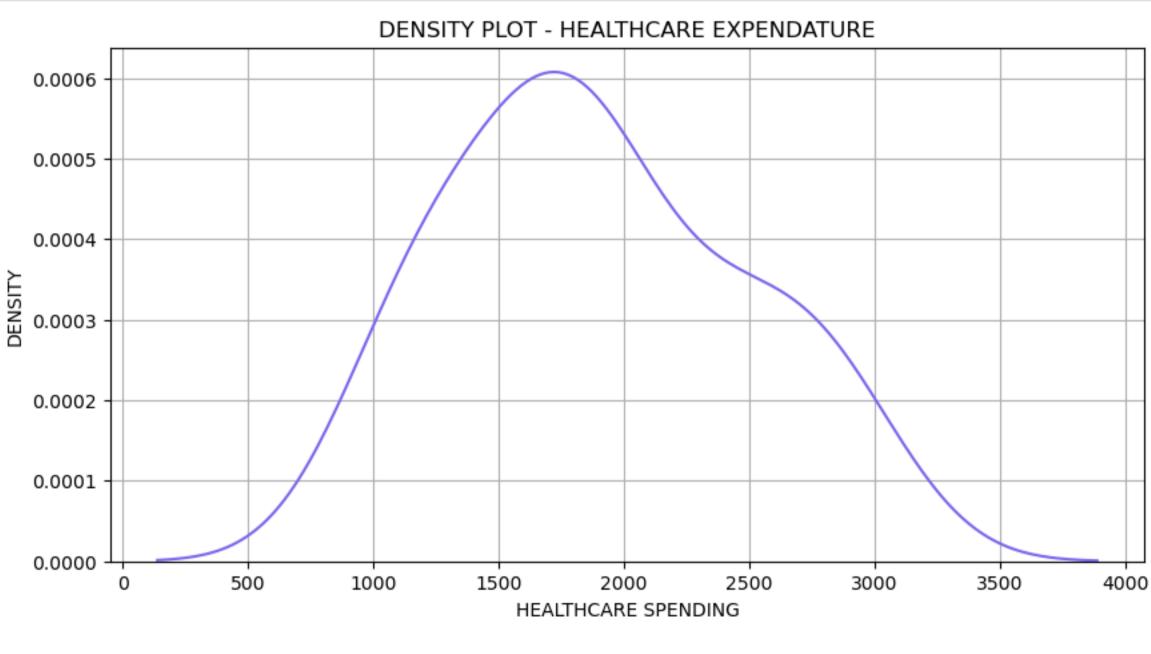
Generating Density Chart.

In [7]: spending_df = pd.read_csv('/Users/aaronbrown/Documents/Classwork/DSC 640 - Data Presentation and Visualization/Data/expenditures_BY_YEAR.csv') spending_data = spending_df spending_data.head(3)

Out [7]

7]:	year	Alcoholic Beverages	Apparel	Cash Contributions	Education	Entertainment	Food	Healthcare	Housing	Miscellaneous	Personal Care	Personal Insurance	Reading	Tobacco Products	Transportation
	0 1984	275	1319	706	303	1055	3290	1049	6674	451	289	1897	132	228	4304
	1 1985	306	1420	805	321	1170	3477	1108	7087	529	303	2016	141	219	4587
	2 1986	271	1346	746	314	1149	3448	1135	7292	522	303	2127	140	230	4842





References

Choosing Colormaps in Matplotlib:

https://matplotlib.org/stable/tutorials/colors/colormaps.html

List of named colors in matplotlib:

https://matplotlib.org/stable/gallery/color/named_colors.html

Seaborn Styling, Color:

https://www.codecademy.com/article/seaborn-design-iia

Plotly legend title:

https://stackoverflow.com/questions/45555266/plotly-legend-title

Bubble Charts in Python:

https://plotly.com/python/bubble-charts/

Built-in Continuous Color Scales in Python. https://plotly.com/python/builtin-colorscales/

Plotly: How to change the colorscheme of a plotly express scatterplot?:

https://stackoverflow.com/questions/60962274/plotly-how-to-change-the-colorscheme-of-a-plotly-express-scatterplot