PYTHON

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import plotly.express as px
import plotly.figure_factory as ff
import seaborn as sns
```

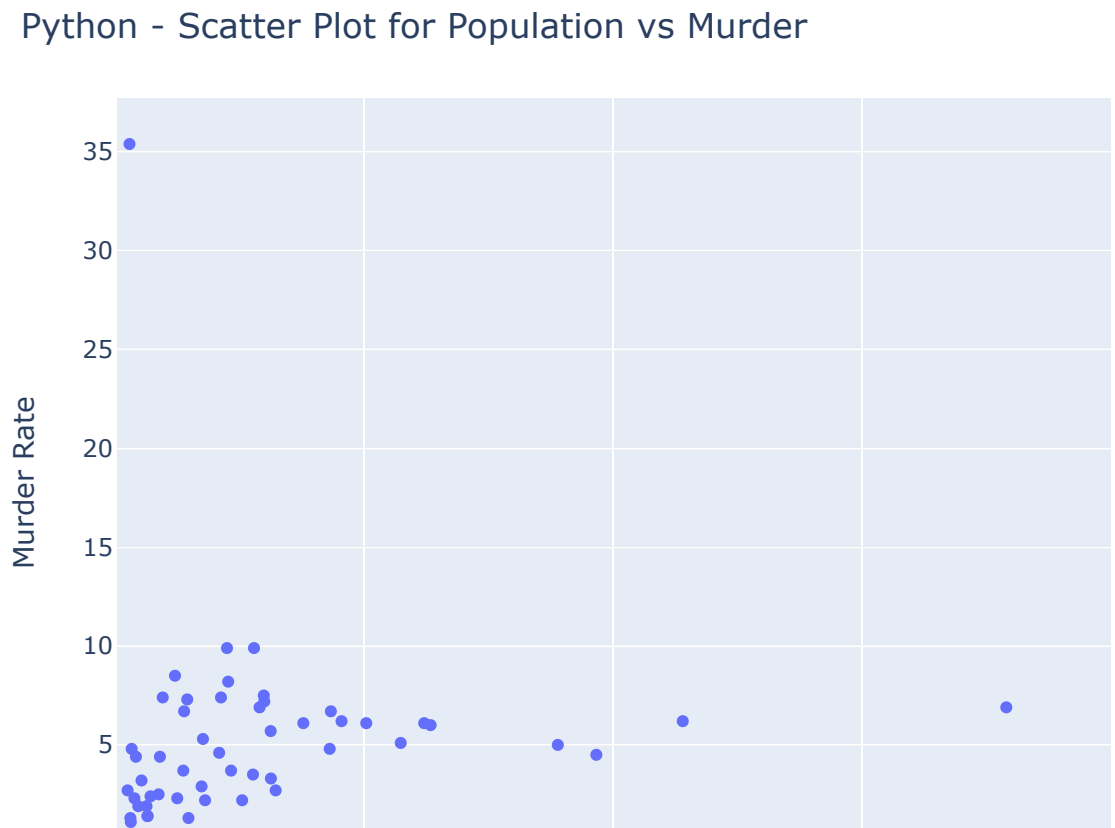
In [2]:
```
#Load crime rates data into a dataframe
crime_rates_df = pd.read_csv('crimerates-by-state-2005.csv')
crime_rates_df.head(5)
```

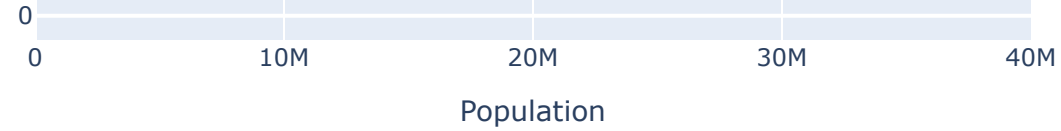
Out[2]:

	state	murder	forcible_rape	robbery	aggravated_assault	burglary	larceny_theft	motor_vehicle_theft	pop
0	United States	5.6	31.7	140.7	291.1	726.7	2286.3	416.7	29
1	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	
3	Arizona	7.5	33.8	144.4	327.4	948.4	2965.2	924.4	
4	Arkansas	6.7	42.9	91.1	386.8	1084.6	2711.2	262.1	

Python - Scatter Plot

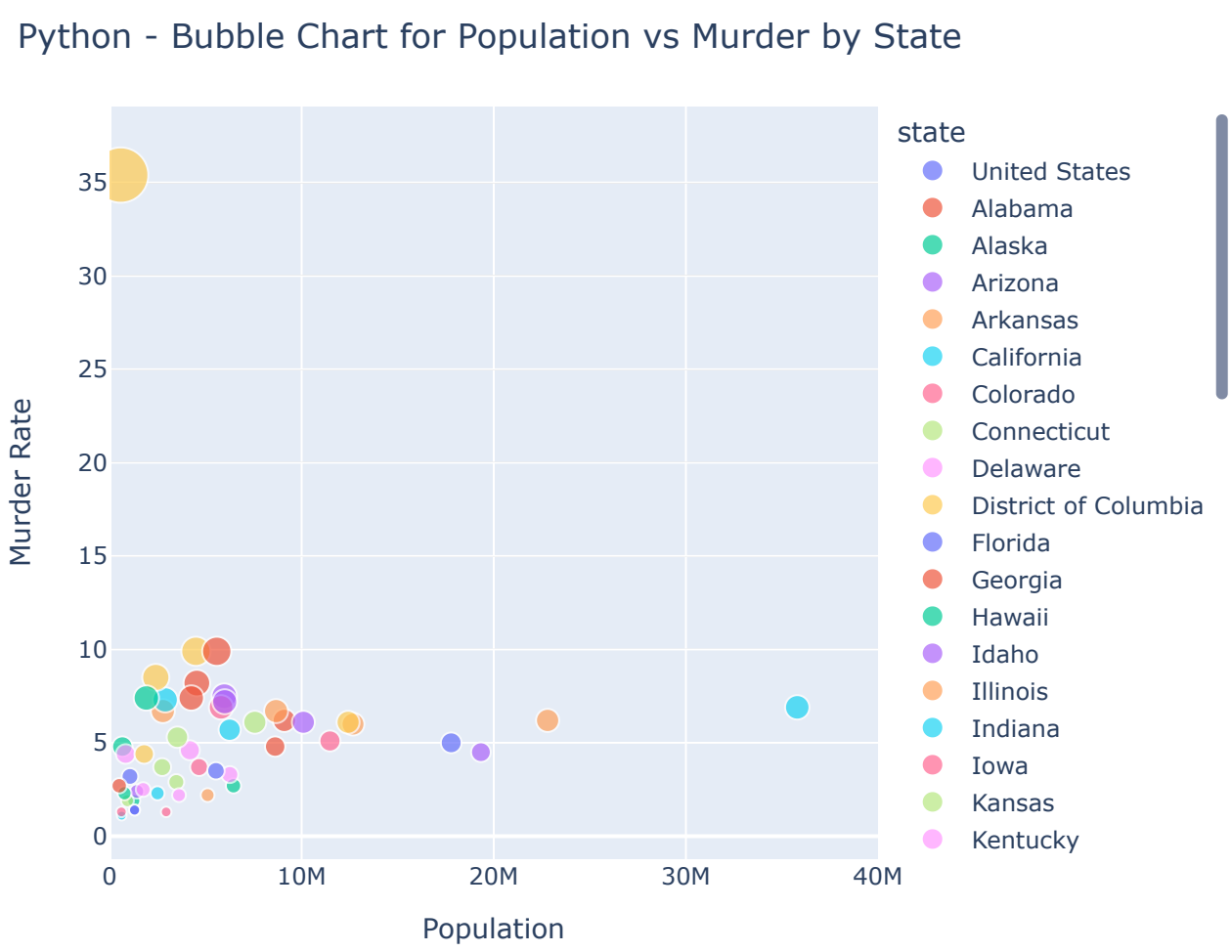
In [3]:
```
fig = px.scatter(crime_rates_df, x="population", y="murder" )
fig.update_layout(xaxis_range=[-0,40000000],title = 'Python - Scatter Plot for Populatio
                  xaxis_title="Population",
                  yaxis_title="Murder Rate")
fig.show("notebook")
```





Python - Bubble chart

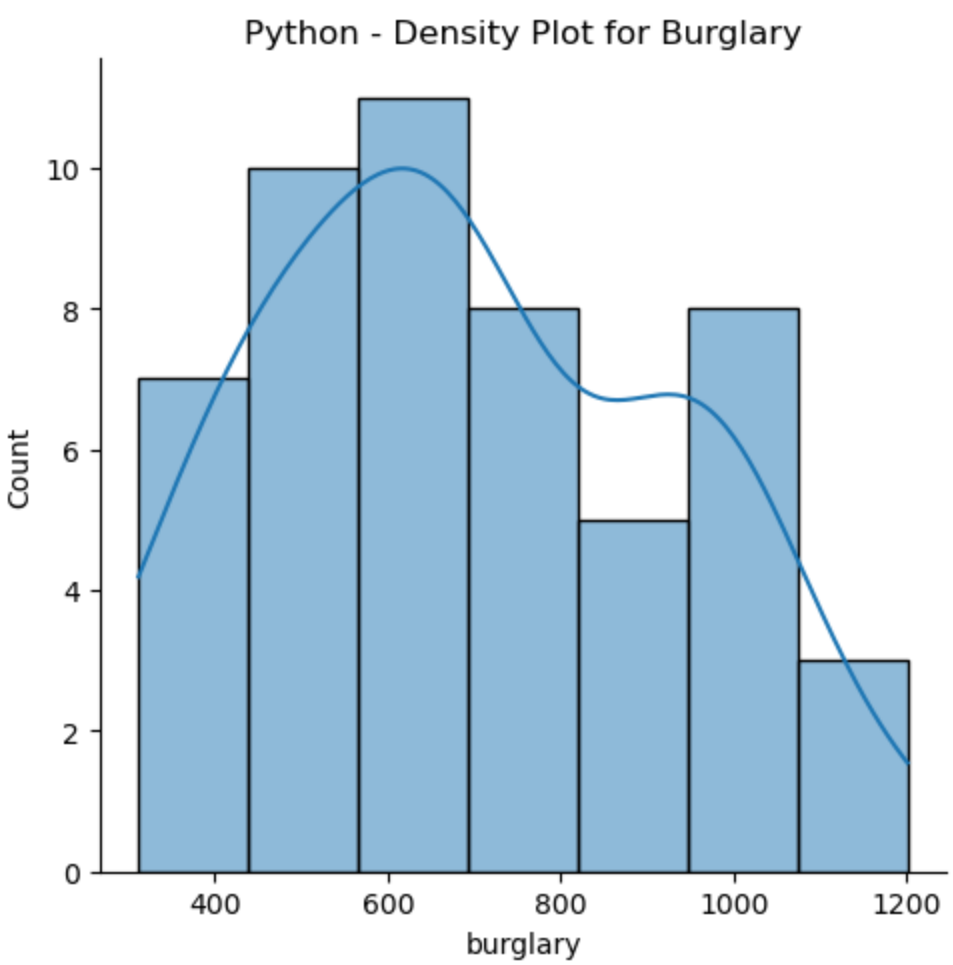
In [11]:
```
fig = px.scatter(crime_rates_df, x="population", y="murder", color="state", size="murder
                 #hover_name="state", log_x=True, size_max=60)
fig.update_layout(xaxis_range=[-0,40000000],title = 'Python - Bubble Chart for Populatio
                  xaxis_title="Population",
                  yaxis_title="Murder Rate")
fig.show("notebook")
```



Python - Density Plot

In [15]:
```
plt.figure(figsize=(15,8))
sns.displot(x=crime_rates_df.burglary,kde=True).set(title="Python - Density Plot for Bur
plt.show()
```

```
<Figure size 1500x800 with 0 Axes>
```


Python - Density Plot for Burglary
Count
0
2
4
6
8
10
400
600
800
1000
1200
burglary

Assignment 3.2 - Week 5&6 in R

Aarti Ramani

2023-07-07

Load required libraries

```
library(readxl)
library(ggplot2)
library(plotly)
```

Read xls into a dataframe

```
crime_rates_df <- read.csv("C:/Masters/GitHub/Summer2023/DSC640-Data Presentation & Visualization/Week5&6/ex4-2/c
rimerates-by-state-2005.csv")
nrow(crime_rates_df)
```

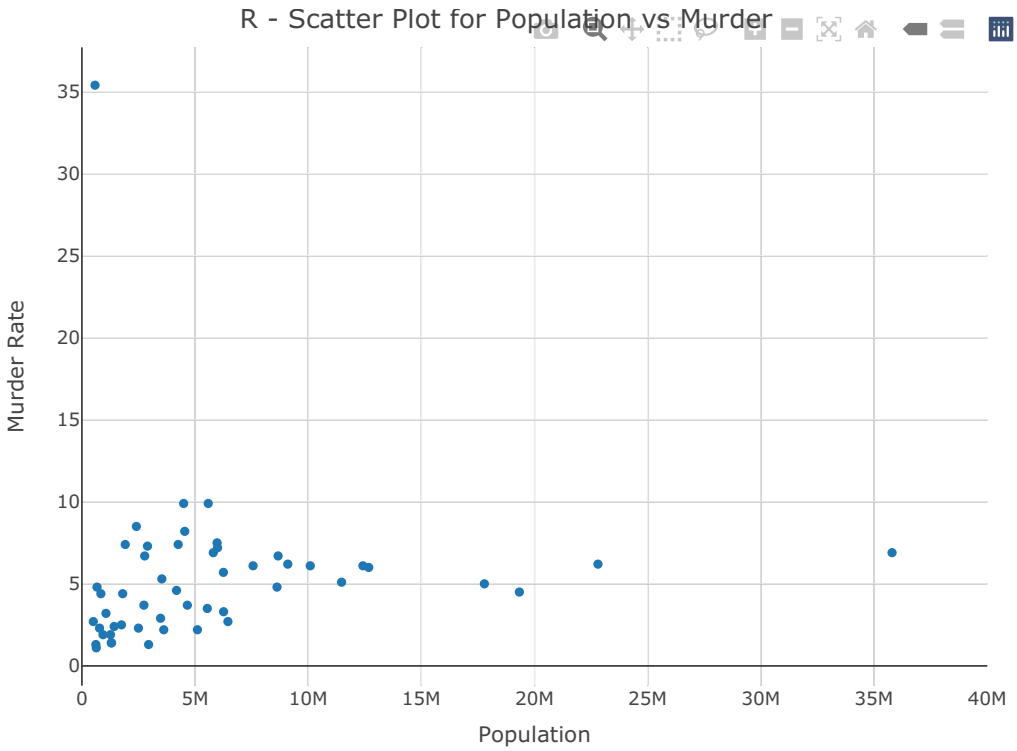
```
## [1] 52
```

```
head(crime_rates_df,5)
```

```
##           state murder forcible_rape robbery aggravated_assault burglary
## 1 United States    5.6          31.7   140.7              291.1    726.7
## 2       Alabama    8.2          34.3   141.4              247.8    953.8
## 3        Alaska    4.8          81.1    80.9              465.1    622.5
## 4       Arizona    7.5          33.8   144.4              327.4    948.4
## 5      Arkansas    6.7          42.9    91.1              386.8   1084.6
##   larceny_theft motor_vehicle_theft population
## 1        2286.3               416.7  295753151
## 2        2650.0               288.3    4545049
## 3        2599.1               391.0     669488
## 4        2965.2               924.4    5974834
## 5        2711.2               262.1    2776221
```

R - SCATTER PLOT

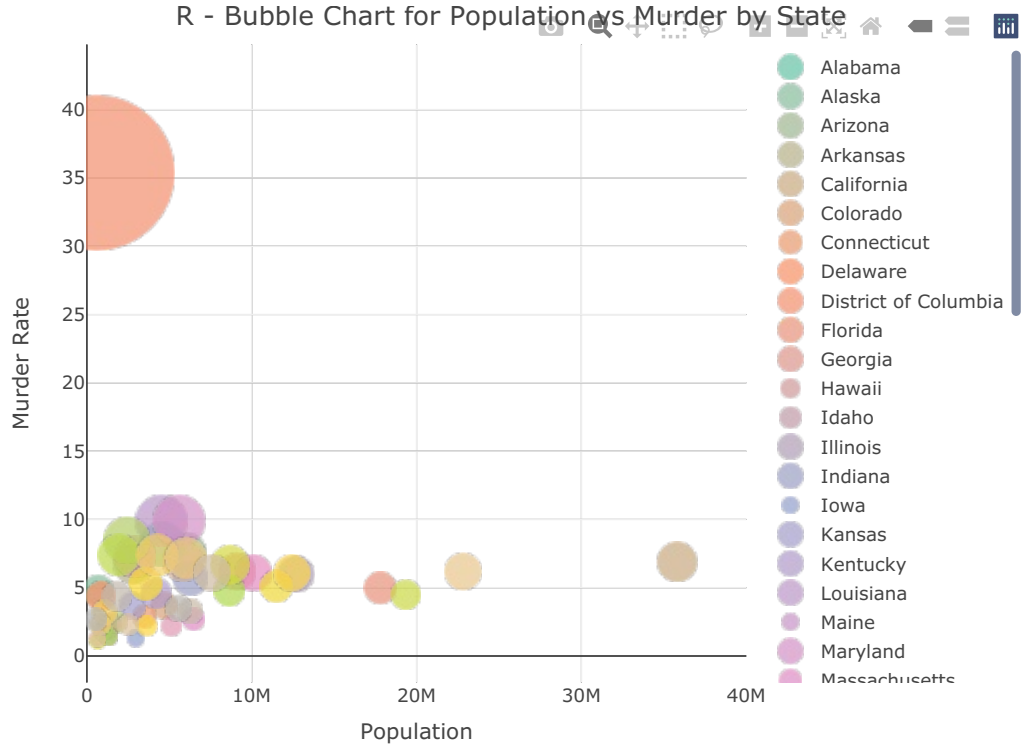
```
fig <- plot_ly(data = crime_rates_df, x = ~population, y = ~murder) %>%
    layout(xaxis = list(range = c(0,40000000),title = 'Population'),
           title="R - Scatter Plot for Population vs Murder",
           yaxis = list(title = 'Murder Rate'))
fig
```



R - BUBBLE CHART

```
fig <- plot_ly(crime_rates_df, x = ~population, y = ~murder, text = ~state,
               type = 'scatter', mode = 'markers', size = ~murder, color = ~state, #colors = 'Paired',
        marker = list( sizemode = 'diameter'))
fig <- fig %>% layout(xaxis = list(range = c(0,40000000),title = 'Population'),
           title="R - Bubble Chart for Population vs Murder by State",
           yaxis = list(title = 'Murder Rate'))

fig
```

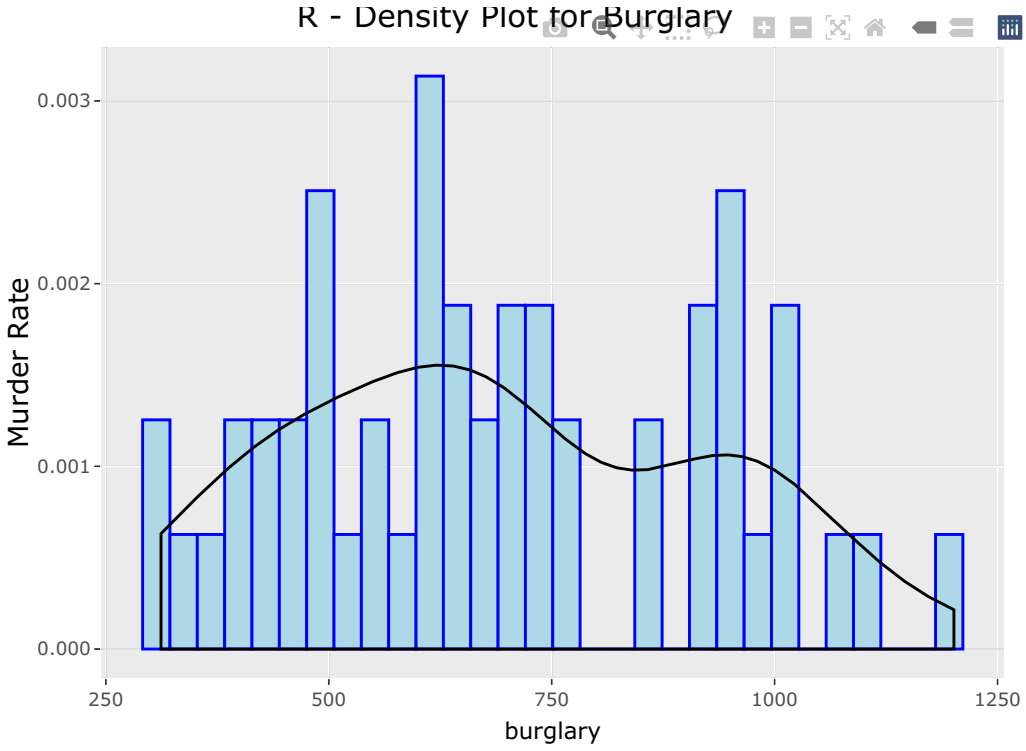


R -DENSITY CHART

```
p <- ggplot(crime_rates_df, aes(burglary))  + geom_density() +
  geom_histogram(aes(y=..density..),bins=30,color="blue",fill="lightblue")
  facet_wrap(~ state)
```

```
## <ggproto object: Class FacetWrap, Facet, gg>
##     compute_layout: function
##     draw_back: function
##     draw_front: function
##     draw_labels: function
##     draw_panels: function
##     finish_data: function
##     init_scales: function
##     map_data: function
##     params: list
##     setup_data: function
##     setup_params: function
##     shrink: TRUE
##     train_scales: function
##     vars: function
##     super:  <ggproto object: Class FacetWrap, Facet, gg>
```

```
fig <- ggplotly(p)
fig <- fig %>% layout(title="R - Density Plot for Burglary",
           yaxis = list(title = 'Murder Rate'))
fig
```



Week5&6

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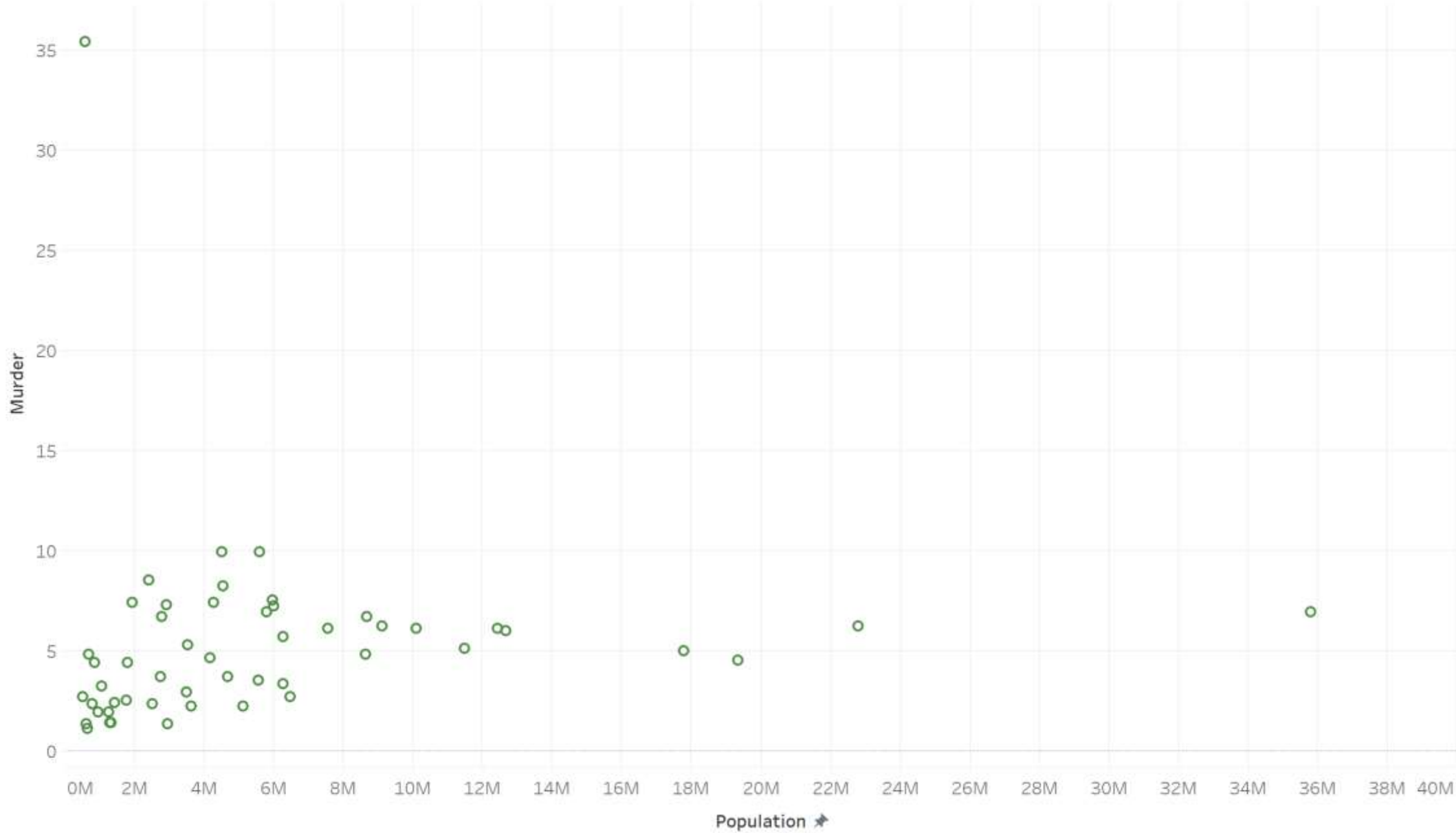
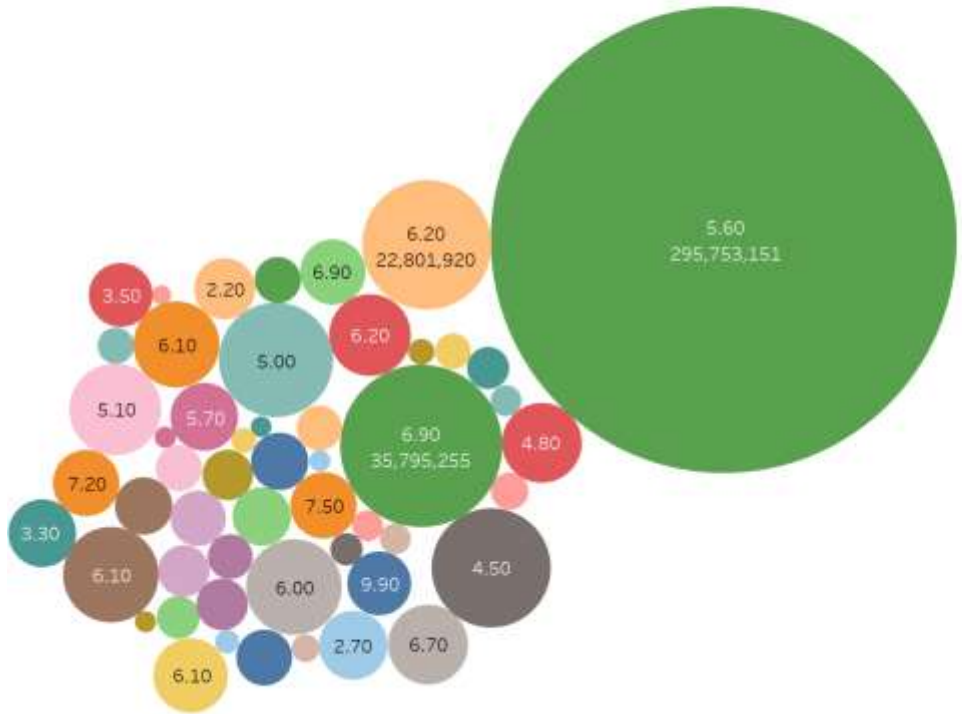
Tableau - Scatter Plot for Population vs Murder



Population vs. Murder.

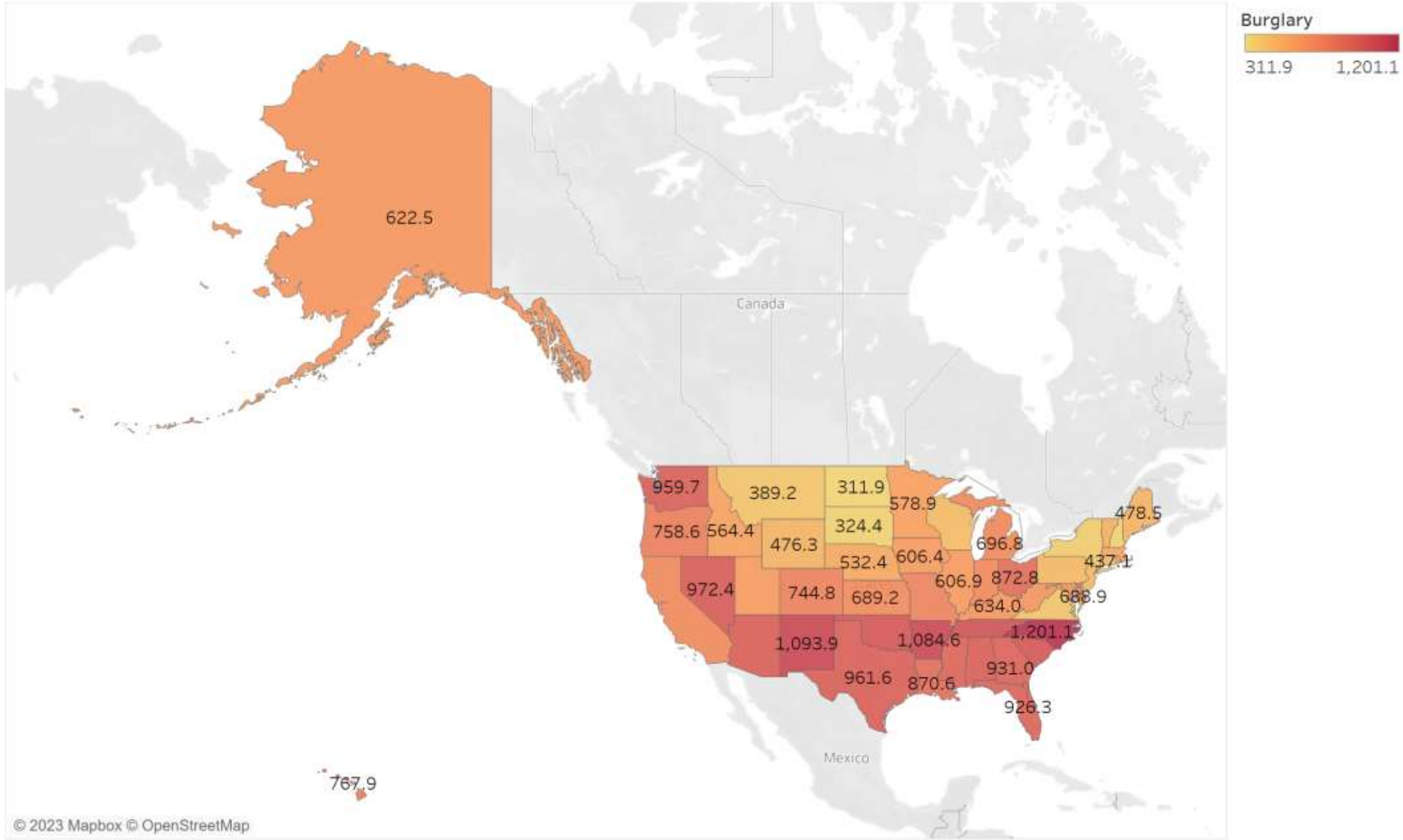
Tableau - Bubble Chart for Population vs Murder by State



Sum of Population and sum of Murder. Color shows details about State. Size shows sum of Population. The marks are labeled by sum of Population and sum of Murder.

State
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- United States
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Tableau - Density Plot for Burglary



Map based on Longitude (generated) and Latitude (generated). Color shows sum of Burglary. The marks are labeled by sum of Burglary. Details are shown for State.