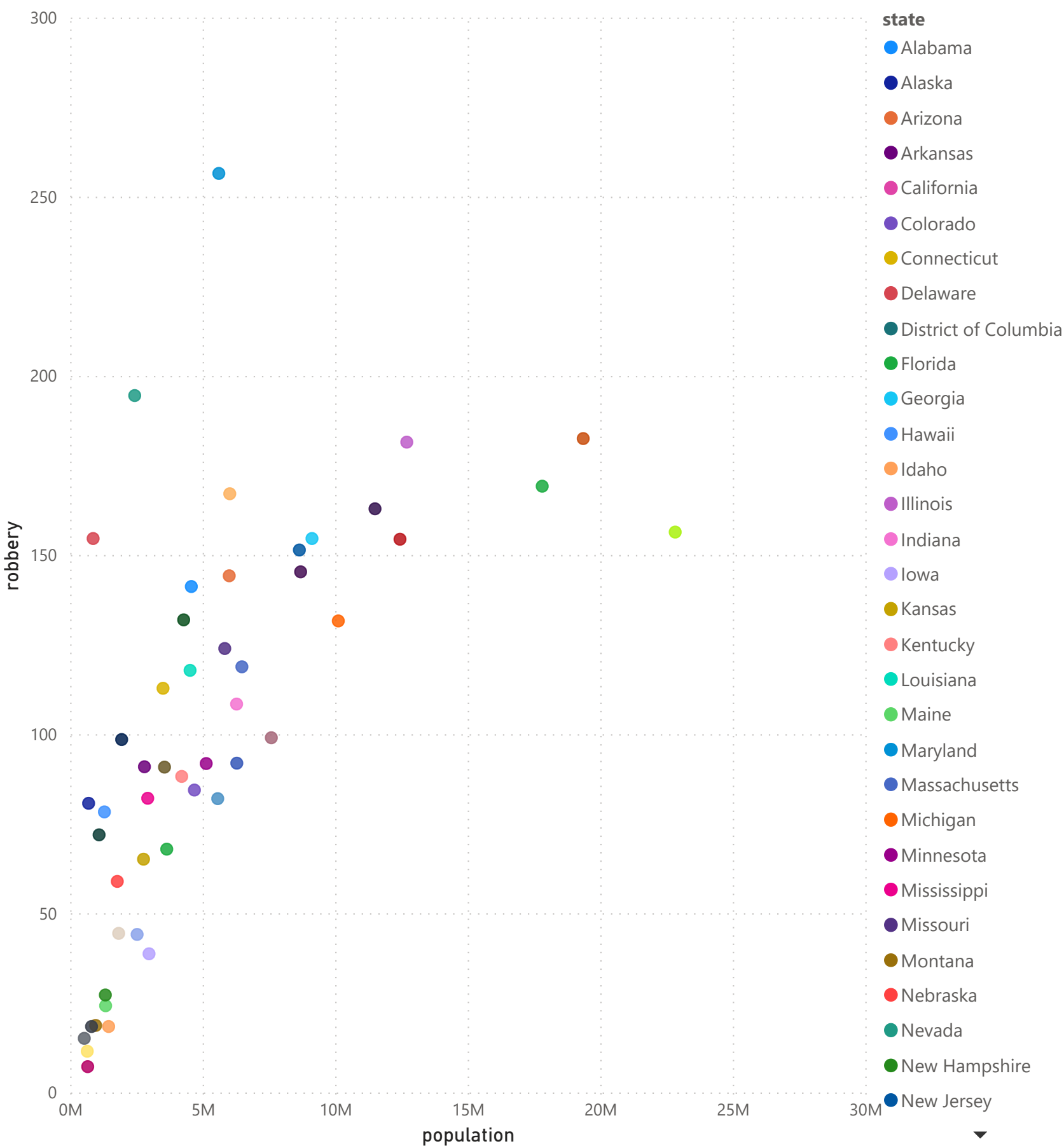


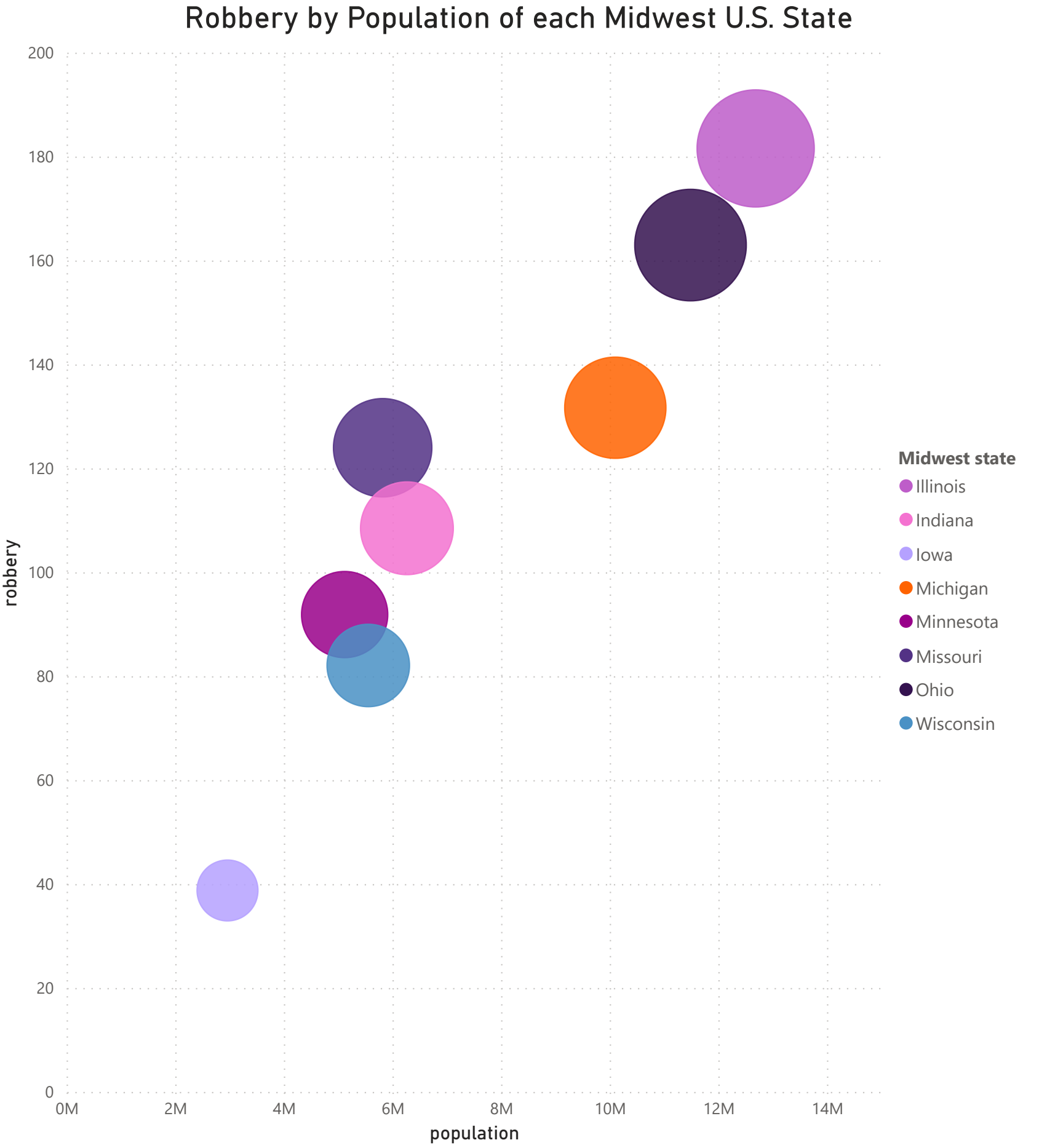
Power Bi Visuals

Scatter Plot

Robbery by Population of each U.S. State

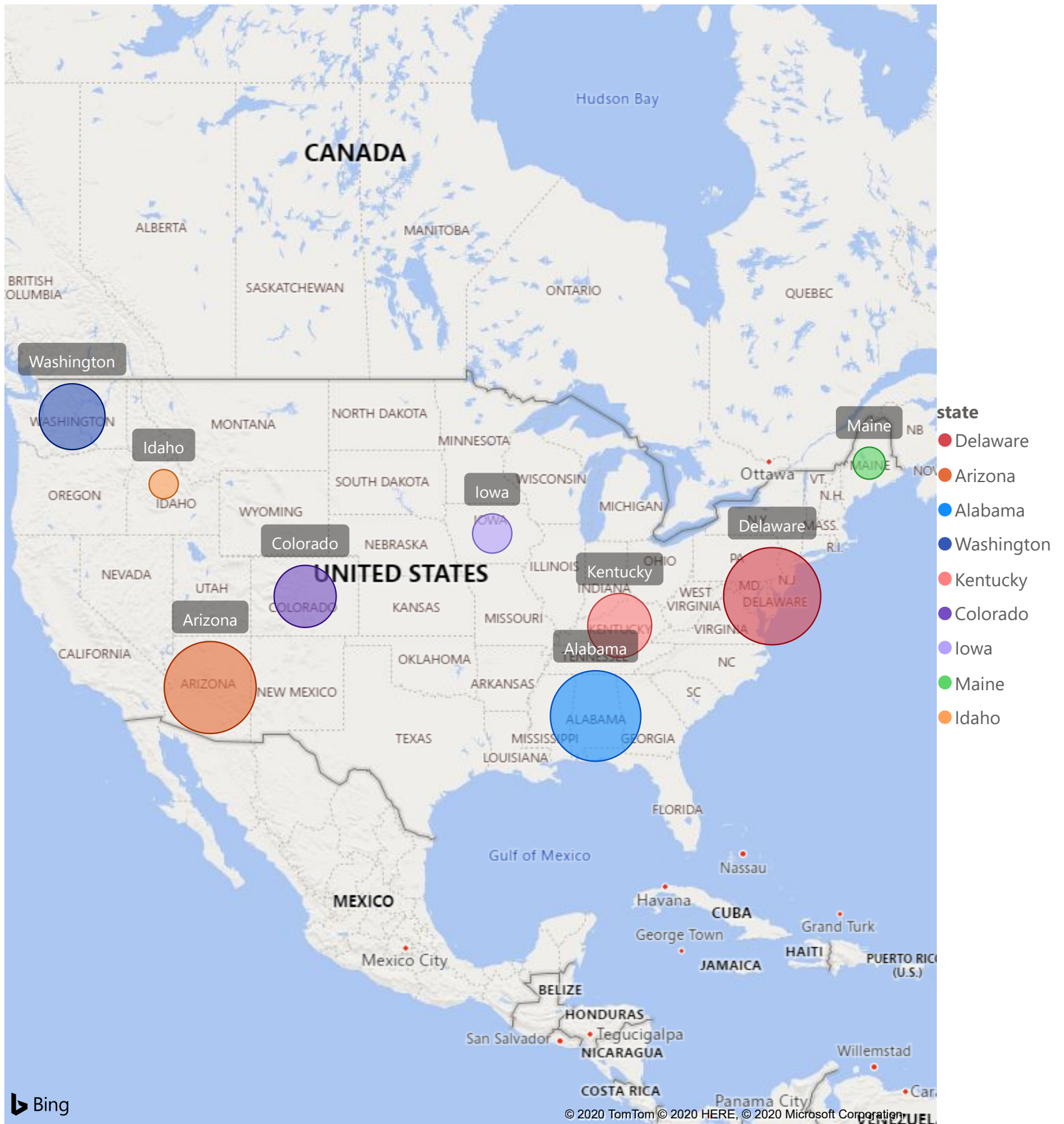


Bubble Plot



Density Plot

Robbery by Population of Several U.S. States



Python Plots

```
In [34]: # Import libraries
import pandas as pd
import matplotlib.pyplot as plt
import squarify
import numpy as np
from scipy.stats import kde
```

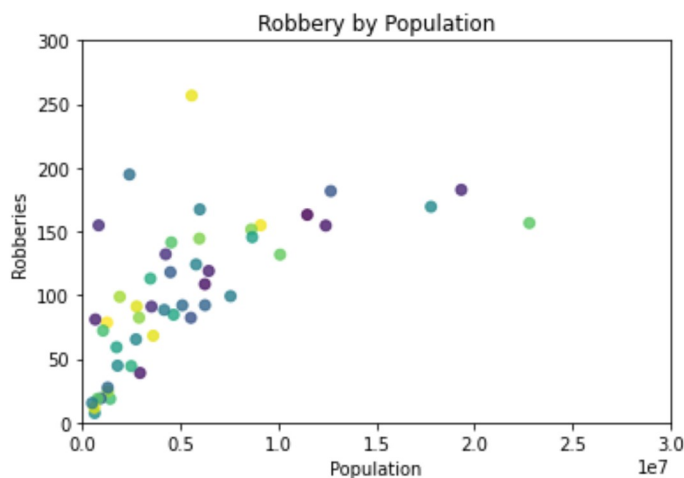
```
In [3]: # Import Data
crime_df = pd.read_csv('crimerates-by-state-2005.csv')
crime_df.head()
```

```
Out[3]:
```

	state	murder	forcible_rape	robbery	aggravated_assault	burglary	larceny_theft	motor_vehicle_theft	p
0	United States	5.6	31.7	140.7	291.1	726.7	2286.3	416.7	2
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	

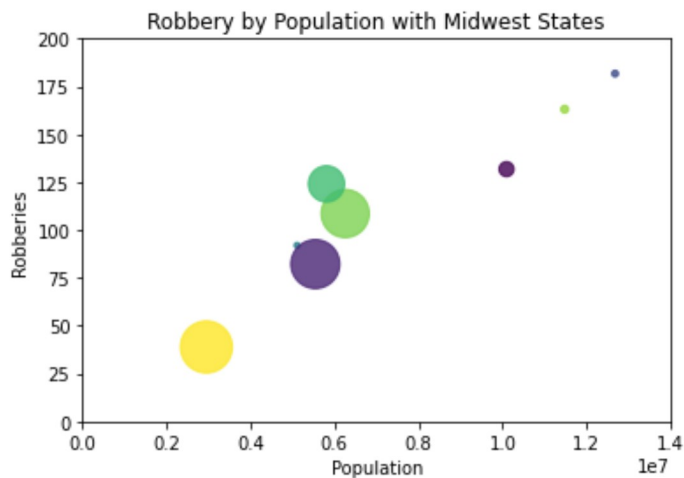
Scatter Plot

```
In [26]: colors = np.random.rand(52)
plt.scatter(crime_df['population'], crime_df['robbery'], c=colors, alpha=0.8, label=
crime_df['state'])
plt.xlim([0, 30000000])
plt.ylim([0, 300])
plt.title("Robbery by Population")
plt.xlabel("Population")
plt.ylabel("Robberies")
plt.show()
```



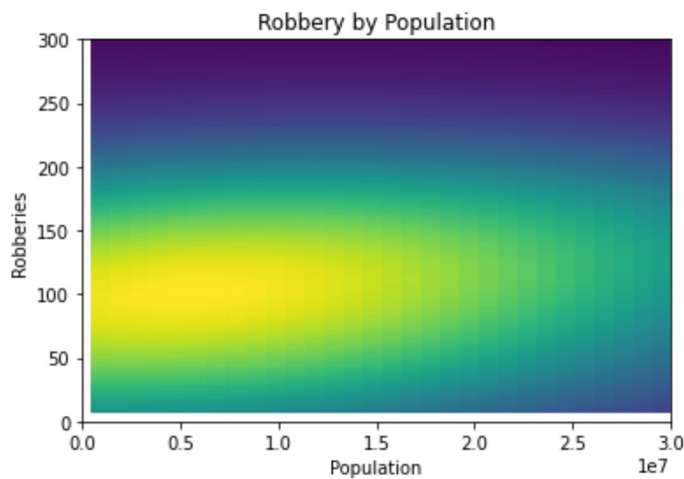
Bubble Plot

```
In [35]: midwest_states = ['Illinois', 'Indiana', 'Iowa', 'Michigan', 'Minnesota', 'Missouri',
    'Ohio', 'Wisconsin']
midwest_crime_df = crime_df[crime_df['state'].isin(midwest_states)]
area = (30 * np.random.rand(8)) ** 2
colors = np.random.rand(8)
plt.scatter(midwest_crime_df['population'], midwest_crime_df['robbery'], c=colors, alpha=0.8, s=area, label=crime_df['state'])
plt.xlim([0, 14000000])
plt.ylim([0, 200])
plt.title("Robbery by Population with Midwest States")
plt.xlabel("Population")
plt.ylabel('Robberies')
plt.show()
```



Density Plot

```
In [41]: nbins = 300
k = kde.gaussian_kde([crime_df['population'], crime_df['robbery']])
xi, yi = np.mgrid[crime_df['population'].min():crime_df['population'].max():nbins*1j, crime_df['robbery'].min():crime_df['robbery'].max():nbins*1j]
zi = k(np.vstack([xi.flatten(), yi.flatten()]))
plt.pcolormesh(xi, yi, zi.reshape(xi.shape))
plt.xlim([0, 30000000])
plt.ylim([0, 300])
plt.title("Robbery by Population")
plt.xlabel("Population")
plt.ylabel('Robberies')
plt.show()
```



3.2 Exercis - R Plots

Gabriel Valenzuela

7/10/2020

R Plots

```
# import libraries

suppressWarnings(library(ggplot2))
library(hexbin)
library(dplyr)
library(gapminder)

# import data

crime <- read.csv('crimerates-by-state-2005.csv')
head(crime)
```

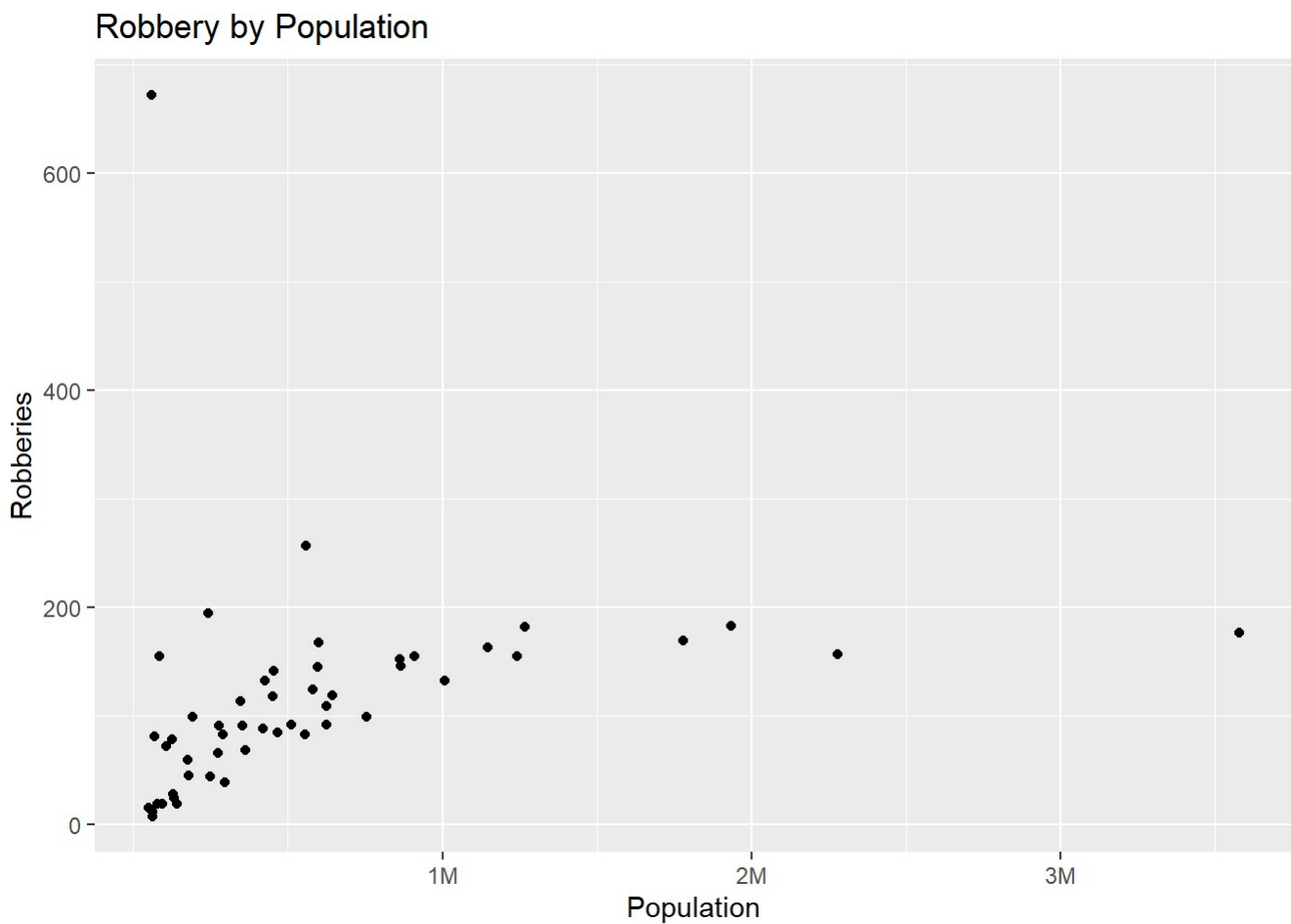
```
##           state murder forcible_rape robbery aggravated_assault burglary
## 1 United States    5.6           31.7   140.7             291.1     726.7
## 2      Alabama    8.2           34.3   141.4             247.8     953.8
## 3       Alaska    4.8           81.1    80.9             465.1     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
## 6   California    6.9           26.0   176.1             317.3     693.3
##  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
## 6         1916.5           712.8  35795255
```

```
crime_state <- crime[!(crime$state=='United States'),]
#crime_state <- crime[!(crime$state=='District of Columbia'),]

pop <- crime_state$population
rob <- crime_state$robbery
state <- crime_state$state
```

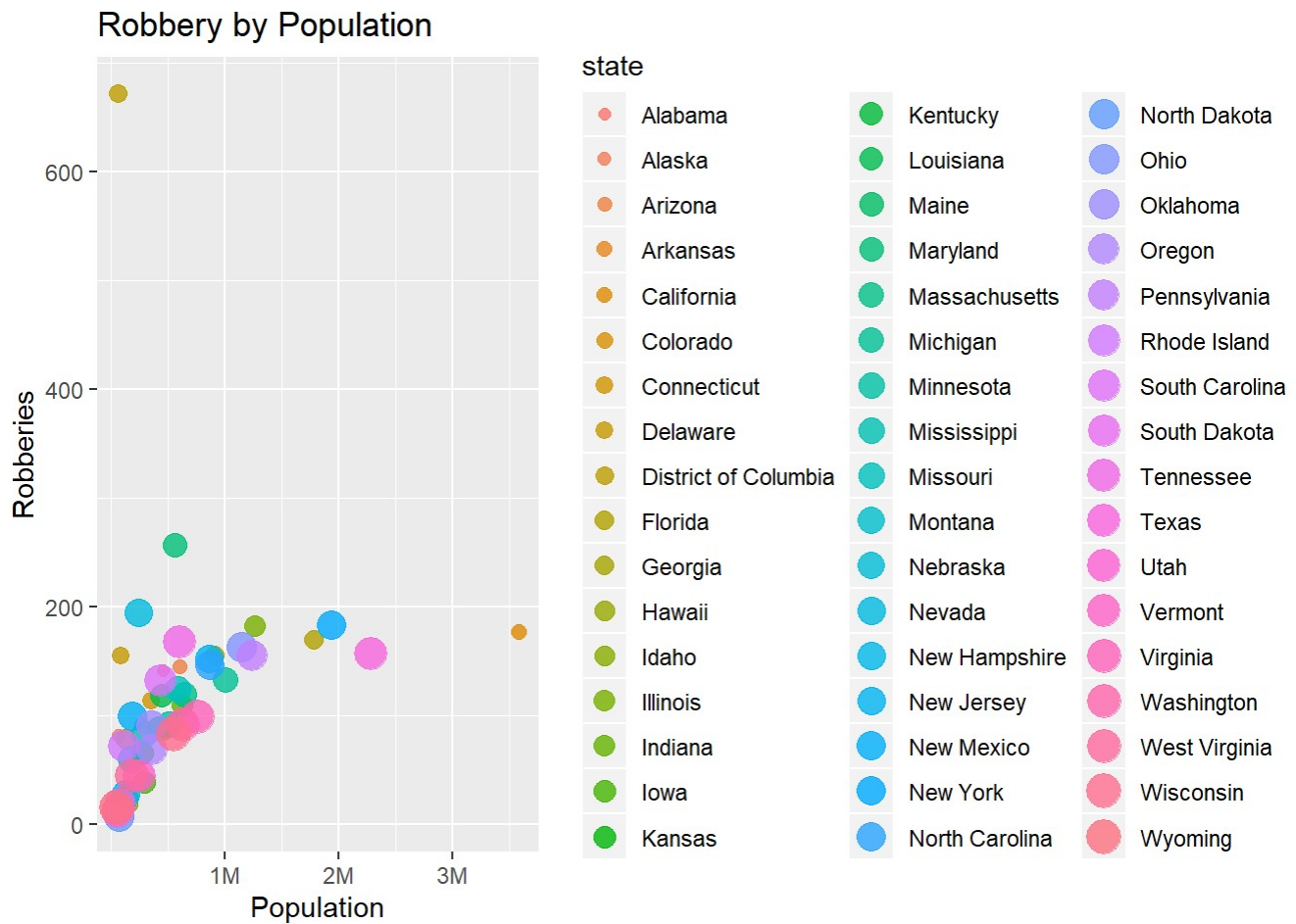
Scatter Plot

```
axs <- ggplot(crime_state, aes(pop, rob)) + geom_point() + labs(x = 'Population', y =  
'Robberies') + ggtitle('Robbery by Population')  
suppressWarnings(axs + scale_x_continuous(breaks = c(10000000, 20000000, 30000000), 1  
abels = c('1M', '2M', '3M')))
```



Bubble Plot

```
suppressMessages(ggplot(crime_state, aes(pop, rob, size = state, color = state)) + ge  
om_point(alpha = 0.8) + labs(x = 'Population', y = 'Robberies') + ggtitle('Robbery by  
Population')+ scale_x_continuous(breaks = c(10000000, 20000000, 30000000), labels = c  
( '1M', '2M', '3M')))
```

Density Plot

```
ggplot(crime_state, aes(pop, rob)) + geom_hex(bins = 25) + scale_fill_continuous(type = "viridis") + theme_bw() + labs(x = 'Population', y = 'Robberies') + ggtitle('Robbery by Population') + scale_x_continuous(breaks = c(10000000, 20000000, 30000000), labels = c('1M', '2M', '3M'))
```

