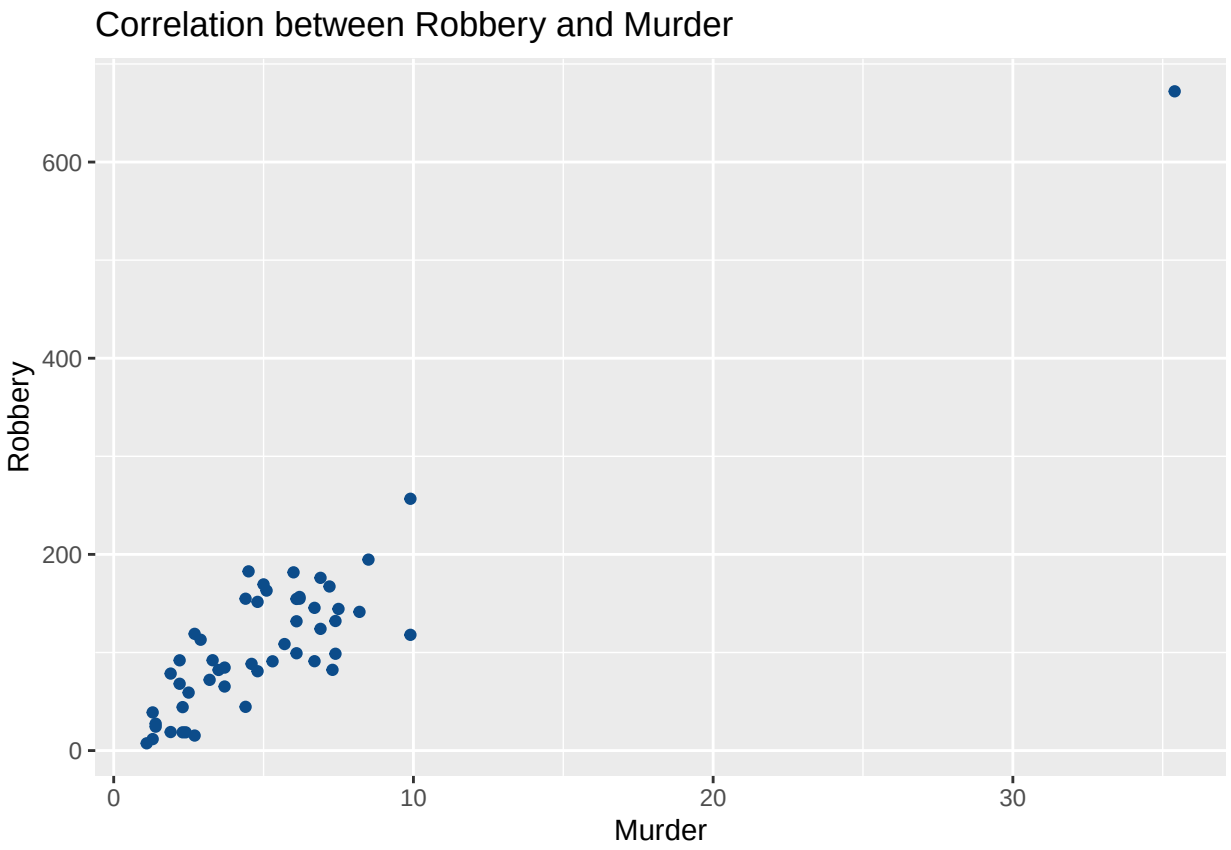
Assignment 4.2

Anjani Bonda

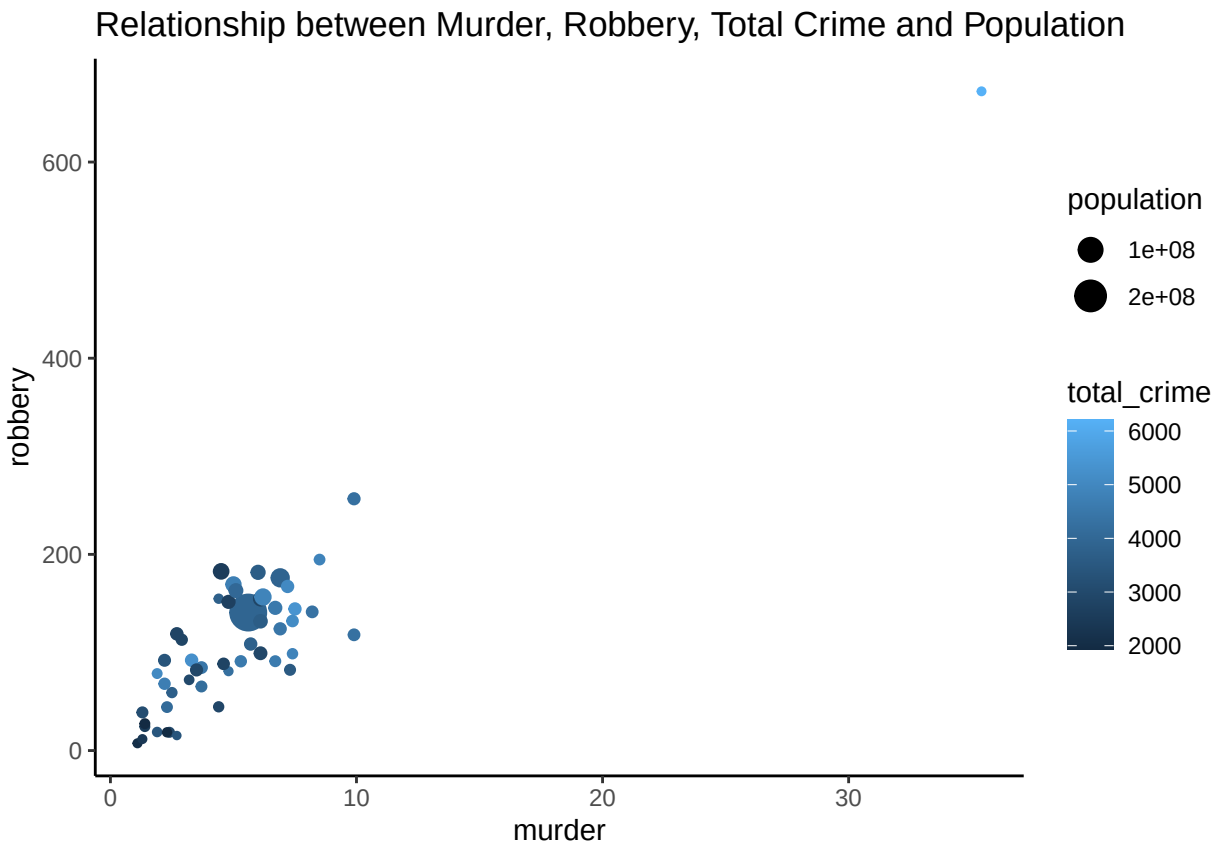
02/03/2023

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

##        state murder forcible_rape robbery aggravated_assault burglary
## 1    Alabama    8.2          34.3   141.4              247.8    953.8
## 2     Alaska    4.8          81.1    80.9              465.1    622.5
## 3    Arizona    7.5          33.8   144.4              327.4    948.4
## 4   Arkansas    6.7          42.9    91.1              386.8   1084.6
## 5 California    6.9          26.0   176.1              317.3    693.3
## 6   Colorado    3.7          43.4    84.6              264.7    744.8
##   larceny_theft motor_vehicle_theft population total_crime state_cont
## 1        2650.0               288.3    4545049      4323.8          1
## 2        2599.1               391.0     669488      4244.5          2
## 3        2965.2               924.4    5974834      5351.1          3
## 4        2711.2               262.1    2776221      4585.4          4
## 5        1916.5               712.8   35795255      3848.9          5
## 6        2735.2               559.5    4660780      4435.9          6
##    name_caps abbr      region midwest
## 1    ALABAMA   AL Rest of USA       0
## 2     ALASKA   AK Rest of USA       0
## 3    ARIZONA   AZ Rest of USA       0
## 4   ARKANSAS   AR Rest of USA       0
## 5 CALIFORNIA   CA Rest of USA       0
## 6   COLORADO   CO Rest of USA       0

##               country year expectancy
## 1         Afghanistan 2008         42
## 2             Albania 2008         73
## 3             Algeria 2008         71
## 4              Angola 2008         46
## 5 Antigua and Barbuda 2008         74
## 6           Argentina 2008         76
```

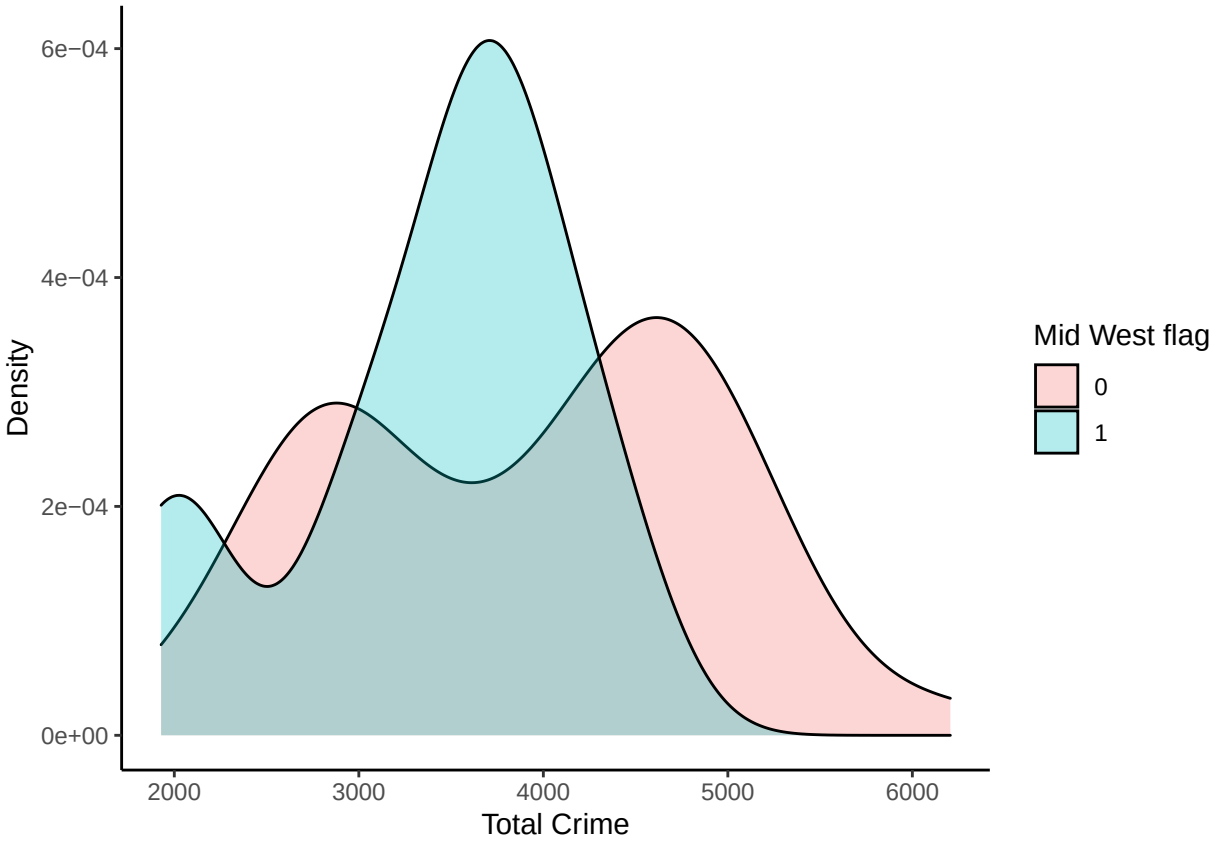
Plot1: Scatter Plot - R



Plot2: Bubble Plot - R



Plot3: Density Plot - R



Assignment 4.2: Scatter Plots, Bubble Charts & Density Plot/Map.

Date: 2/3/2023

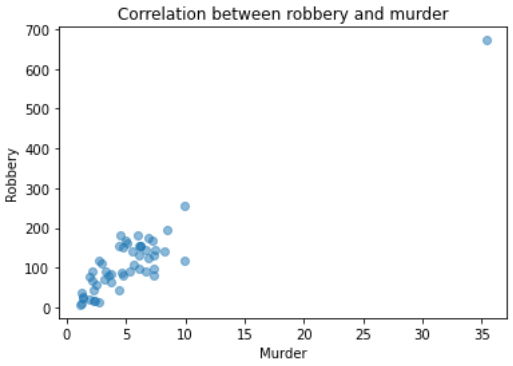
In [7]:
```
# Import libraries
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
import chart_studio.plotly as py
import cufflinks as cf
import seaborn as sns
import plotly.express as px
```

In [8]:
```
# Read world population data
dirData = 'ex4-2/'
f_crime = 'crimerates-by-state-2005.csv'

dir_crime = dirData+f_crime
crime = pd.read_csv(dir_crime)
crime_state = crime[crime['state']!='United States']

print(crime_state.head())
```

```
        state  murder  forcible_rape  robbery  aggravated_assault  burglary  \
1     Alabama     8.2           34.3    141.4               247.8     953.8
2      Alaska     4.8           81.1     80.9               465.1     622.5
3     Arizona     7.5           33.8    144.4               327.4     948.4
4    Arkansas     6.7           42.9     91.1               386.8    1084.6
5  California     6.9           26.0    176.1               317.3     693.3

   larceny_theft  motor_vehicle_theft  population
1         2650.0                288.3     4545049
2         2599.1                391.0      669488
3         2965.2                924.4     5974834
4         2711.2                262.1     2776221
5         1916.5                712.8    35795255
```

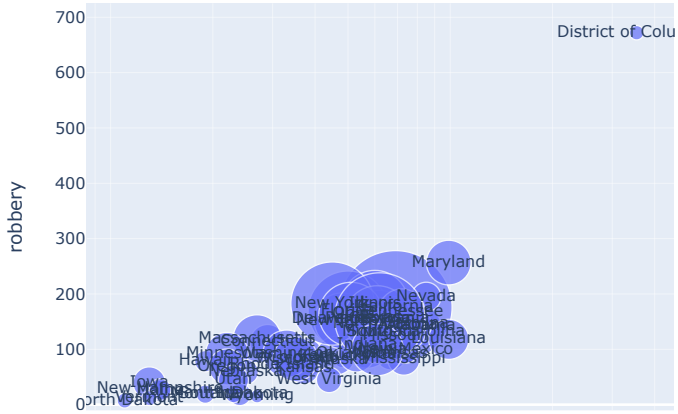
1. Scatter plot - Python

In [9]:
```
# Create a scatter plot showing correlation between murder and robbery

plt.scatter(x=crime['murder'], y=crime['robbery'],alpha=0.5)
plt.title('Correlation between robbery and murder')
plt.xlabel('Murder')
plt.ylabel('Robbery')
plt.show()
```



2. Bubble Chart - Python

In [30]:
```
fig = px.scatter(crime_state, x='murder', y='robbery', size='population', text='state',
                 log_x= True, size_max= 60,
                 labels = {'Murder', 'Robbery'},
                 title = 'Murder vs Robbery by Population',
                 width = 600, height = 500)

fig.show()
```

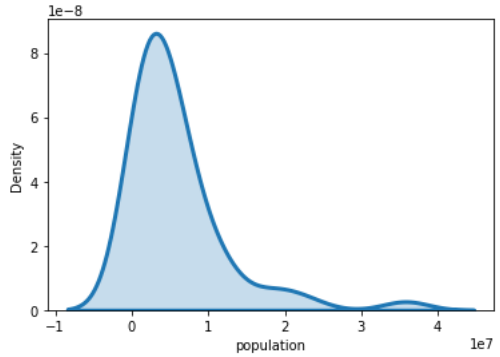


3. Density plot - Python

In [24]:
```
# Plotting distribution of population

sns.distplot(crime_state['population'], hist = False, kde = True,
                 kde_kws = {'shade': True, 'linewidth': 3})
```

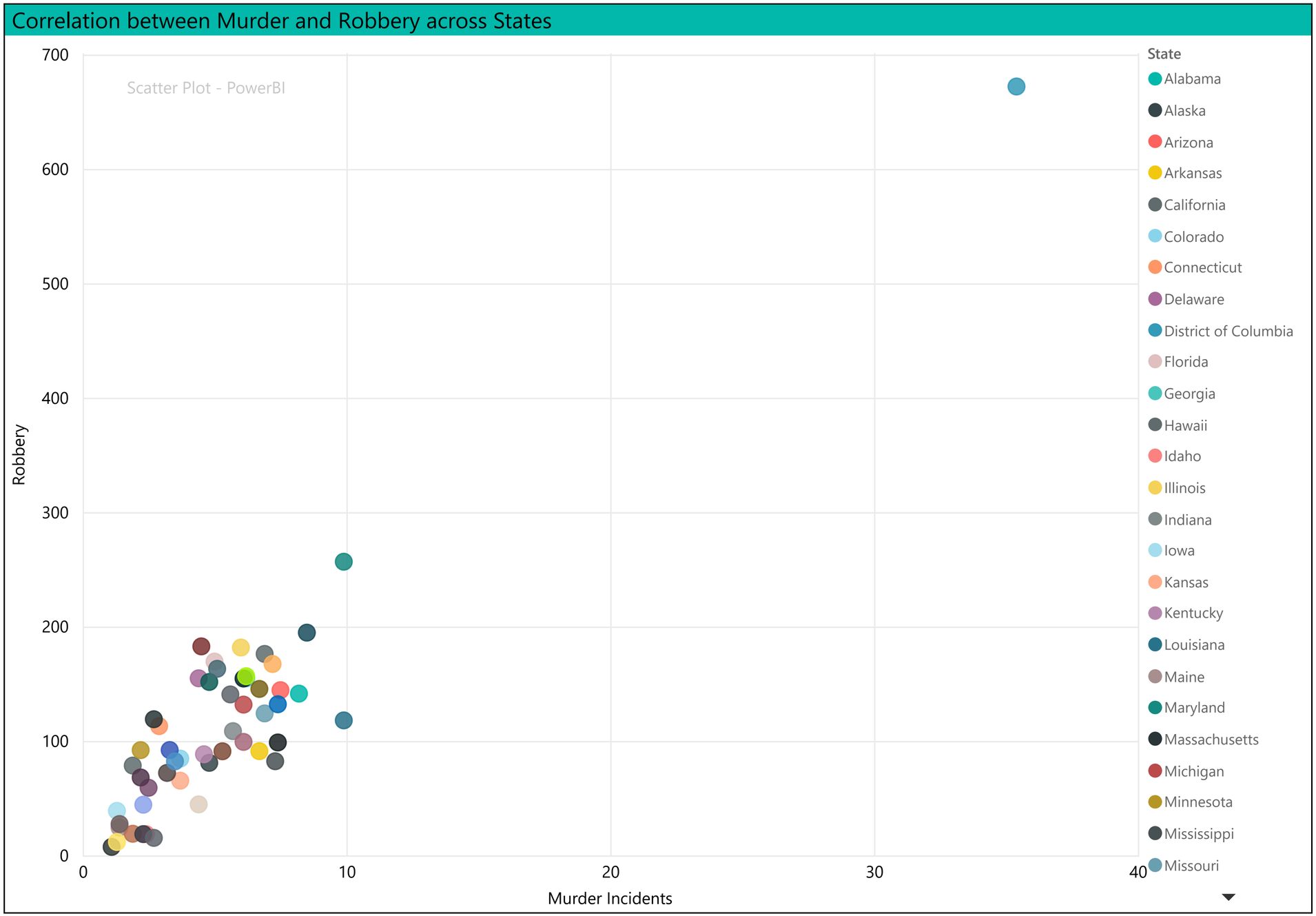
```
/Users/anjanibonda/opt/anaconda3/lib/python3.9/site-packages/seaborn/distributions.py:2619: FutureWarning:

`distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `di
splot` (a figure-level function with similar flexibility) or `kdeplot` (an axes-level function for kernel density plo
ts).
```

Out[24]:
```
<AxesSubplot:xlabel='population', ylabel='Density'>
```

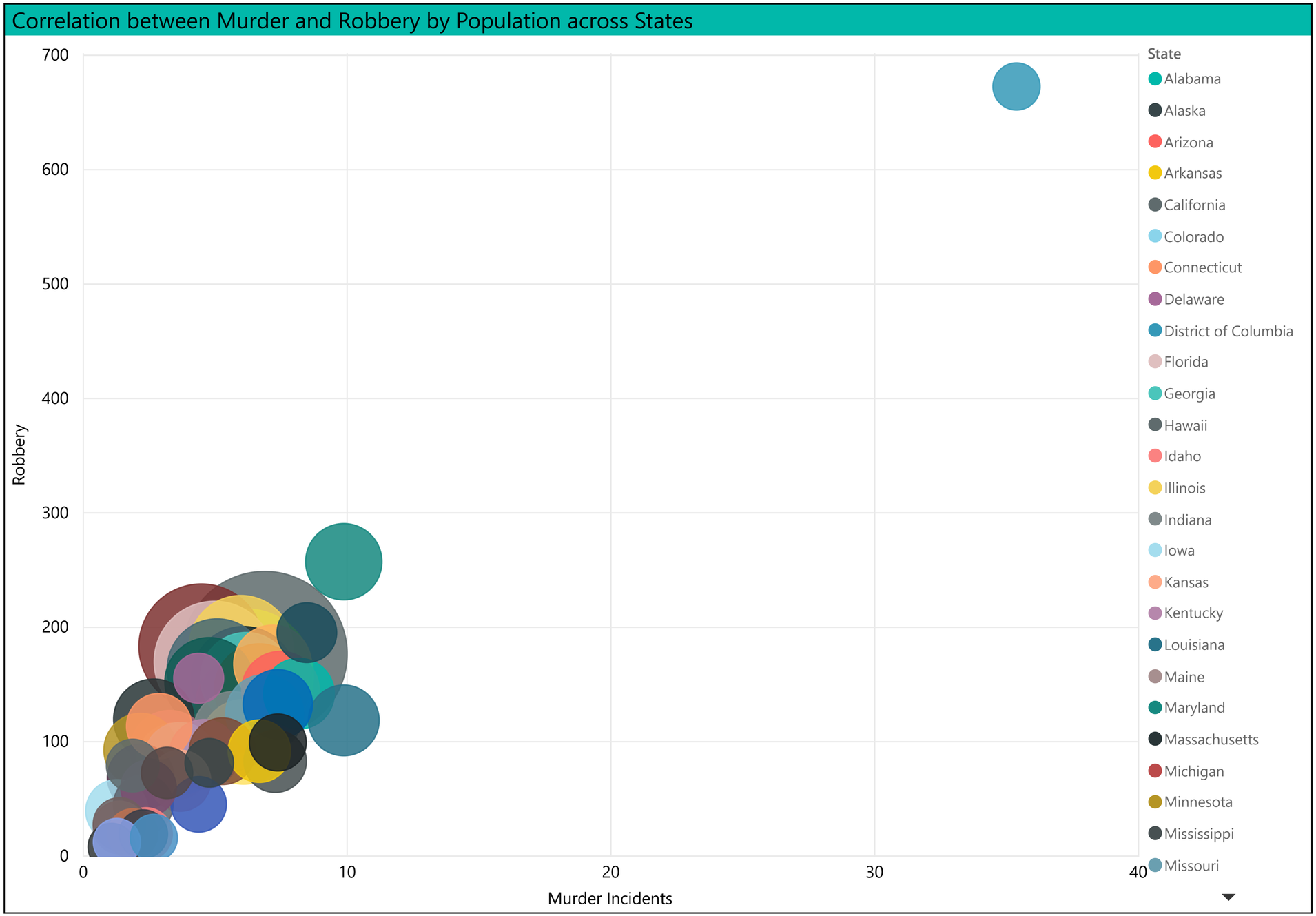


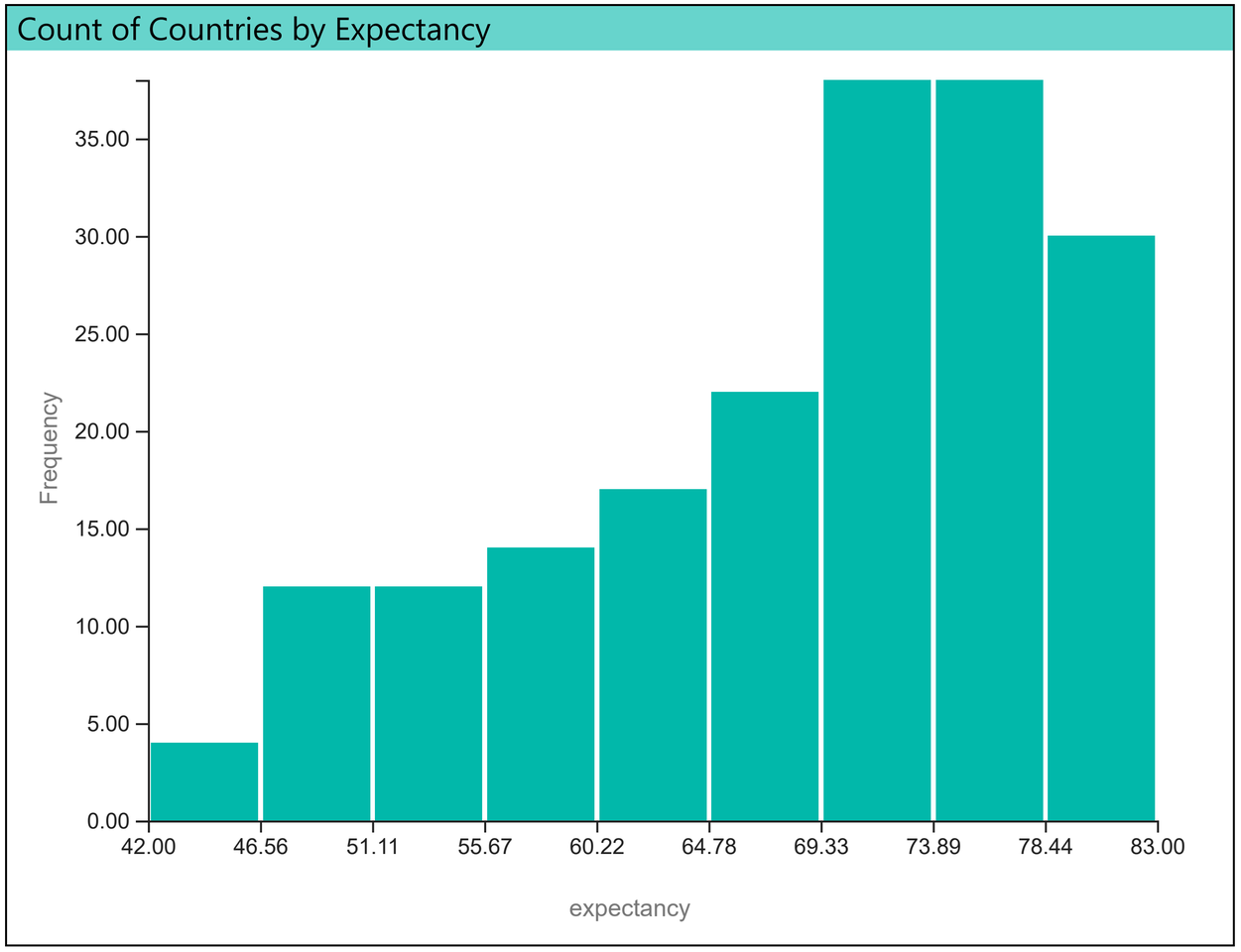
End of code

Scatter Plot - PBI



Bubble Chart - PBI




Count of Countries by Expectancy
Frequency
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
42.00
46.56
51.11
55.67
60.22
64.78
69.33
73.89
78.44
83.00
expectancy