# Week 7&8: scatterplots, bubble charts, and density plots

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*import required packages*

In [24]:
```
import plotly.express as px
import pandas as pd
import numpy as np
from IPython.display import HTML
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.figure_factory as ff

from IPython.core.interactiveshell import InteractiveShell
InteractiveShell.ast_node_interactivity = 'all'
```

In [2]:
```
# load data set

crimes = pd.read_csv('Data/crimerates-by-state-2005.csv')
```

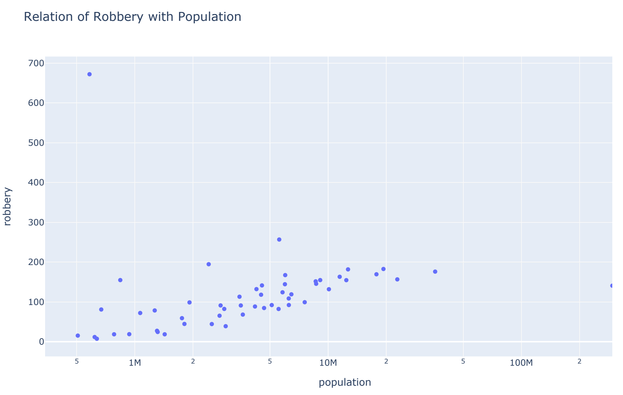
In [3]:
```
# display shape and head

crimes.shape
crimes.head()
```

Out[3]:
```
(52, 9)
```

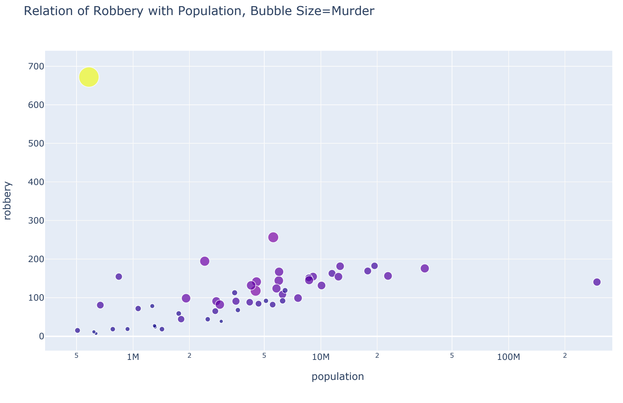
Out[3]:

| | state | murder | forcible_rape | robbery | aggravated_assault | burglary | larceny_theft | motor_vehicle_theft | population |
|---|---|---|---|---|---|---|---|---|---|
| 0 | United States | 5.6 | 31.7 | 140.7 | 291.1 | 726.7 | 2286.3 | 416.7 | 295753151 |
| 1 | Alabama | 8.2 | 34.3 | 141.4 | 247.8 | 953.8 | 2650.0 | 288.3 | 4545049 |
| 2 | Alaska | 4.8 | 81.1 | 80.9 | 465.1 | 622.5 | 2599.1 | 391.0 | 669488 |
| 3 | Arizona | 7.5 | 33.8 | 144.4 | 327.4 | 948.4 | 2965.2 | 924.4 | 5974834 |
| 4 | Arkansas | 6.7 | 42.9 | 91.1 | 386.8 | 1084.6 | 2711.2 | 262.1 | 2776221 |

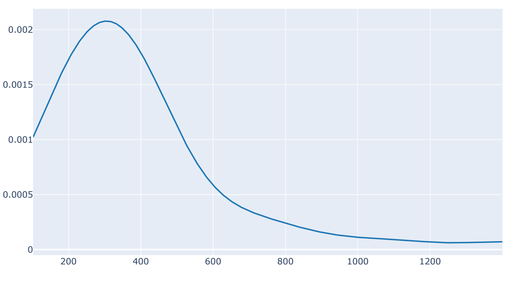
In [4]:
```
# plot scatter plot

fig = px.scatter(crimes, x = 'population', y ='robbery',log_x=True,
                 title = 'Relation of Robbery with Population', width=1000,height=600)
fig.show()
```



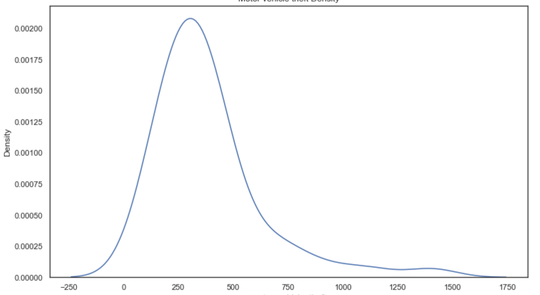

In [10]:
```
# plot bubble chart

fig = px.scatter(crimes, x = 'population', y ='robbery',log_x=True,size='murder',color='murder',
                 title = 'Relation of Robbery with Population, Bubble Size=Murder', width=1000,height=600)
fig.show()
```




In [37]:
```
# plot density chart

lst = crimes['motor_vehicle_theft'].to_list()

fig = ff.create_distplot([lst],group_labels = ['distplot'],show_hist=False,show_rug=False)  #title = 'Motor veh
# fig.update_layout()
fig.show()
```




In [20]:
```
# plot density chart

sns.set(style='white')

plt.figure(figsize=(12,7))

sns.kdeplot(crimes['motor_vehicle_theft'])
plt.title('Motor vehicle theft Density')
plt.show();
```

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