Week 5 & 6 Assignment - Python

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Course: DSC640 - Data Presentation and Visualization
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These two weeks we are going to be focused on scatterplots, bubble charts, and density plots and using various tools to create these visualizations. You must consolidate all the charts into ONE document with each chart labeled with the type of chart and technology - for example: Python - Bar Chart. Failure to label and consolidate the charts will resort in points being taken off or a 0 for the assignment.

Sample Datasets (click on the Downloads tab.)

You may also download them directly from this link: Exercise 4.2 Datasets (click the link to download a folder containing the datasets.)

You need to submit:
1 scatterplot, 1 bubble chart and 1 density map using Tableau or PowerBI
1 scatterplot, 1 bubble chart and 1 density plot chart using Python
1 scatterplot, 1 bubble chart and 1 density plot chart using R

1 scatterplot, 1 bubble chart and 1 density plot chart using Python

In [49]:
```
## Importing libraries required for this exercise
import pandas as pd
import numpy as np
import squarify
import matplotlib.pyplot as plt
%matplotlib inline
import plotly.express as px
import seaborn as sns
import plotly.io as pio
pio.renderers.default='notebook'
```

1. Python - Scatterplot Chart

Plotting Scatterplot chart for Crime rates by State for 2005

In [12]:
```
## Load the dataset into dataframe
crime_df = pd.read_csv("crimerates-by-state-2005.csv")
crime_df.head()
```

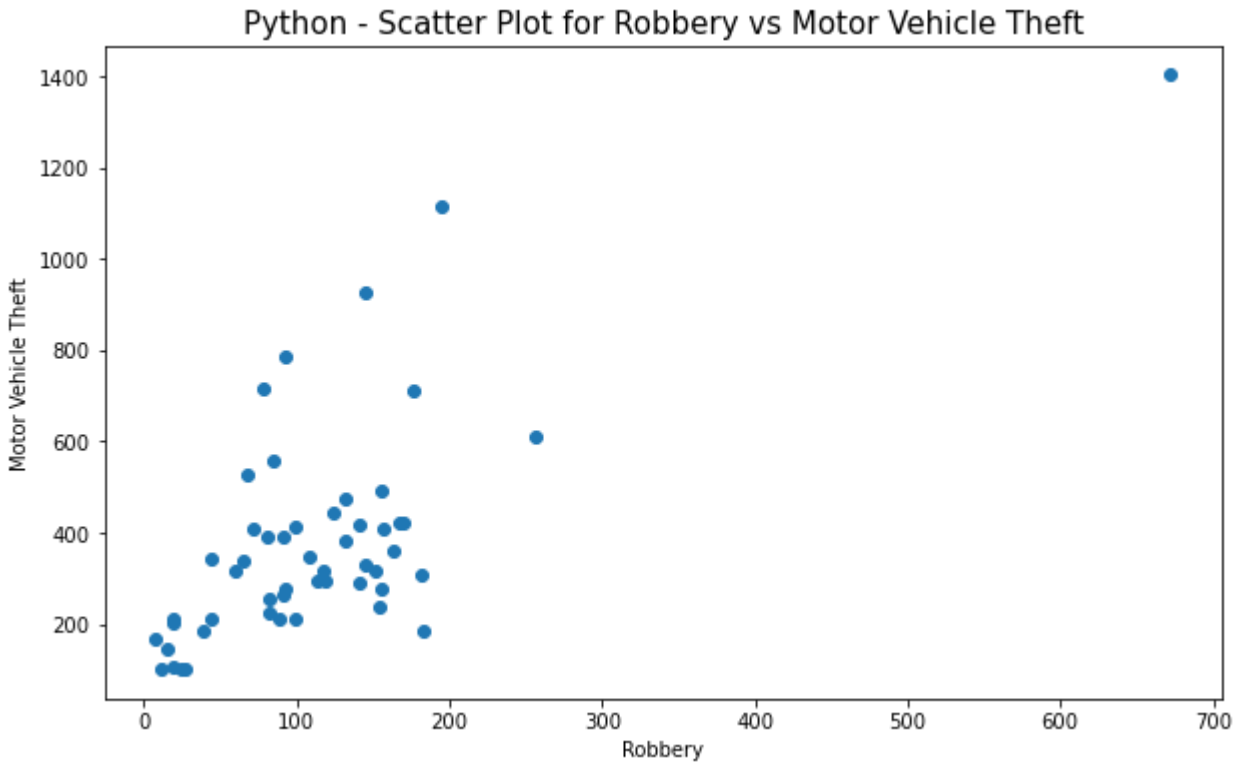
Out[12]:

	state	murder	forcible_rape	robbery	aggravated_assault	burglary	larceny_theft	motor_vehicle_
0	United States	5.6	31.7	140.7	291.1	726.7	2286.3	
1	Alabama	8.2	34.3	141.4	247.8	953.8	2650.0	

	state	murder	forcible_rape	robbery	aggravated_assault	burglary	larceny_theft	motor_vehicle_
2	Alaska	4.8	81.1	80.9	465.1	622.5	2599.1	
3	Arizona	7.5	33.8	144.4	327.4	948.4	2965.2	
4	Arkansas	6.7	42.9	91.1	386.8	1084.6	2711.2	

We will find correlation between Robbery and Motor Vehicle theft

In [19]:
```
plt.figure(figsize=(10,6))
plt.scatter(crime_df.robbery ,crime_df.motor_vehicle_theft, marker ="o")
plt.title("Python - Scatter Plot for Robbery vs Motor Vehicle Theft", fontsize = 15)
plt.xlabel('Robbery')
plt.ylabel('Motor Vehicle Theft')
plt.show()
```



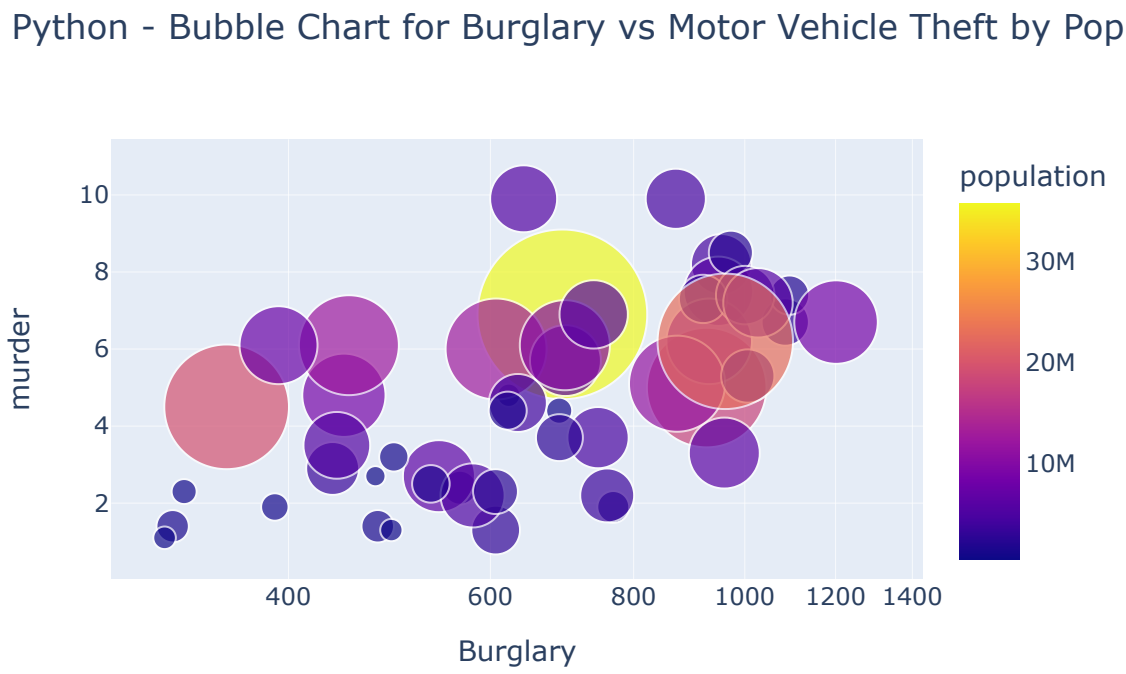
2. Python - Bubbel Plot

Plotting bubble plot for Motor Vehicle Theft by Population

In [31]:
```
## Remving duplicate and outliers from the dataset; So, removing "United States" and "D
crime_state_df = crime_df[crime_df['state'] != 'United States']
crime_state_df = crime_state_df[crime_state_df['state'] != 'District of Columbia']
```

In [50]:
```
## Bubble Plot
fig = px.scatter(crime_state_df, x = 'burglary', y = 'murder', size = 'population', col
                 hover_name = 'state', log_x = True, size_max = 60,
                 labels = {'burglary':'Burglary','motor_vehicle_theft':'Motor Vehicle Th
                 title = 'Python - Bubble Chart for Burglary vs Motor Vehicle Theft by P
```

```
                  width=600, height=400)
fig.show()
```



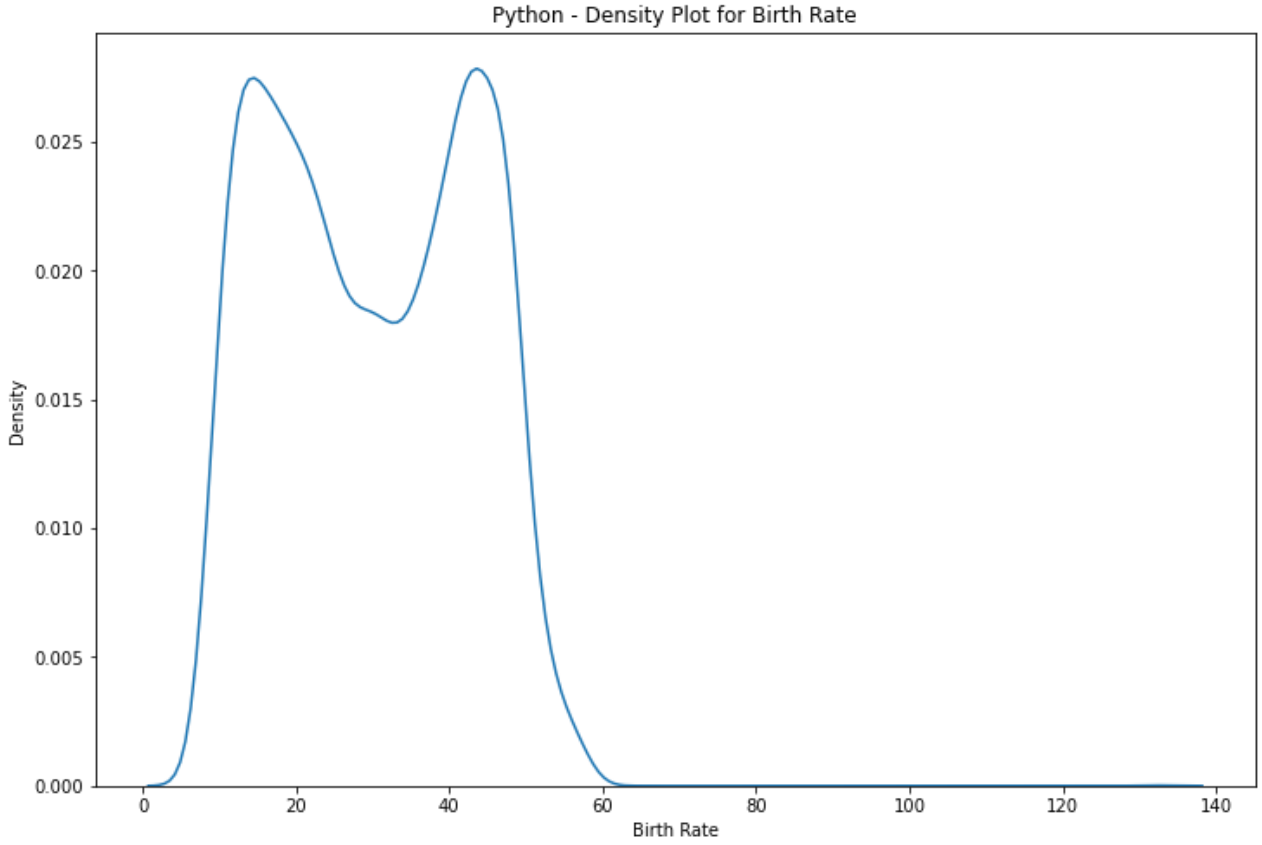
3. Python - Density Plot

In [33]:
```
## Creating the dataframe for birth rate yearly dataset
birth_df = pd.read_csv("birth-rates-yearly.csv")
birth_df.head()
```

Out[33]:

	year	rate
0	1960	36.400
1	1961	35.179
2	1962	33.863
3	1963	32.459
4	1964	30.994

In [35]:
```
## Creating density chart
plt.figure(figsize=(12,8))
sns.kdeplot(birth_df['rate'])
plt.xlabel('Birth Rate')
plt.title("Python - Density Plot for Birth Rate")
plt.show()
```


Python - Density Plot for Birth Rate
Density
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
100
120
140
Birth Rate

In [ ]: