Weeks 7&8 Exercises

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In [50]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from bs4 import BeautifulSoup
import urllib.request, urllib.parse, urllib.error
import json
import requests
import ssl
import re

%pwd
```

Out[50]:
```
'C:\\Users\\Andrew\\Documents\\Grad School\\DSC 540 - Data Preparation\\Assignments'
```

Activity 9, page 294

In [18]:
```
#Check SSL Certificate
cert_check = ssl.create_default_context()
cert_check.check_hostname = False
cert_check.verify_mode = ssl.CERT_NONE
```

In [19]:
```
#Read html from url
url = 'https://www.gutenberg.org/browse/scores/top'
response = requests.get(url)
```

In [20]:
```
#Write a small function to check the status of the web request
def check_status(r):
    if r.status_code==200:
        print('Connection Up')
        return 1
    else:
        print('Connection Down')
        return -1
```

In [21]:
```
#Check the status of response:
check_status(response)
```

```
Connection Up
```

Out[21]:
```
1
```

In [22]:
```
#Decode the response and pass it on to BeautifulSoup for HTML Parsing
r_decoded = response.content.decode(response.encoding)
good_soup = BeautifulSoup(r_decoded,'html.parser')
```

In [23]:
```
#Find all the href tags and store them in the list of links. Check how the list looks like - print first 30 elements
list_o_links=[]

for link in good_soup.find_all('a'):
    list_o_links.append(link.get('href'))
list_o_links[:30]
```

Out[23]:
```
['/',
 '/about/',
 '/about/',
 '/policy/collection_development.html',
 '/about/contact_information.html',
 '/about/background/',
 '/policy/permission.html',
 '/policy/privacy_policy.html',
 '/policy/terms_of_use.html',
 '/ebooks/',
 '/ebooks/',
 '/ebooks/bookshelf/',
 '/browse/scores/top',
 '/ebooks/offline_catalogs.html',
 '/help/',
 '/help/',
 '/help/copyright.html',
 '/help/errata.html',
 '/help/file_formats.html',
 '/help/faq.html',
 '/policy/',
 '/help/public_domain_ebook_submission.html',
 '/help/submitting_your_own_work.html',
 '/help/mobile.html',
 '/attic/',
 '/donate/',
 '/donate/',
 '#books-last1',
 '#authors-last1',
 '#books-last7']
```

In [24]:
```
#Use a regular expression to find the numeric digits in these links. These are the file numbers for hte top 100 eBook
#Initialize the empty list to hold the file numbers over an appropriate range
#and use regex to find the numeric digits in the link href string. Use the findall method
num_digits=[]

for i in range(19,119):
    link=list_o_links[i]
    link=link.strip()
    # Regular expression to find the numeric digits in the link (href) string
    n=re.findall('[0-9]+',link)
    if len(n)==1:
        # Append the filenumber casted as integer
        num_digits.append(int(n[0]))
```

In [25]:
```
#Print the file numbers
print(num_digits)
```

```
[1, 1, 7, 7, 30, 30, 1342, 11, 1661, 68771, 84, 58585, 2701, 174, 68769, 68765, 345, 98, 68768, 64317, 4300, 1232, 2
591, 33283, 2600, 1400, 105, 1952, 2554, 35, 3176, 1184, 16328, 30254, 43, 5200, 6130, 25344, 1260, 2542, 68773, 51
4, 120, 74, 1080, 1497, 768, 219, 45, 76, 844, 16, 27827, 1399, 135, 46, 67098, 158, 5740, 4363, 55, 996, 28054, 687
78, 205, 1727, 68772, 8492, 68767, 2680, 244, 68775, 2814, 3177, 68774, 161, 1998, 20228, 31284, 4980, 10, 215, 36,
766, 203, 236, 408, 3600, 730, 3825, 147, 12]
```

In [26]:
```
#What does the soup object's text look like? Use the .text method and print only the first
# 2,000 characters (do not print the whole thing as it is too long).
print(good_soup.text[:2000])
```

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The Prophet by Kahlil Gibran (654)
Moby Dick; Or, The Whale by Herman Melville (653)
The Picture of Dorian Gray by Oscar Wilde (652)
A classical dictionary: containing a copious account of all the proper names mentioned in ancient au (640)

```
Twenty-five years in the Secret Service: The recollections of a spy by Henri le Caron (593)
Dracula by Bram Stoker (585)
A Tale of Two Cities by Charles Dickens (566)
Illustrations of the manners, customs, & condition of the North American Indians, Vol. I (of 2): Wit (553)
The Great Gatsby by F. Scott  Fitzger
```

In [27]:
```
#Search in the extracted text (using regular expression) from the soup object to find
#the names of top 100 Ebooks (Yesterday's rank)
title_list=[]
```

In [28]:
```
#Create a starting index. It should point at the text "Top 100 Ebooks yesterday".
#Hint: Use splitlines() method of the soup.text. It splits the lines of the text of the soup object.
starting_index=good_soup.text.splitlines().index('Top 100 EBooks yesterday')
```

In [29]:
```
#Loop 1-100 to add the strings of next 100 lines to this temporary list. Hint: splitlines() method
for i in range(100):
    title_list.append(good_soup.text.splitlines()[starting_index+2+i])
```

In [30]:
```
#Use a regular expression to extract only text from the name strings and append them to an empty list
list_titles=[]
for i in range(100):
    id1,id2=re.match('^[a-zA-Z]* ',title_list[i]).span()
    list_titles.append(title_list[i][id1:id2])
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_25080\2653769660.py in <cell line: 3>()
      2 list_titles=[]
      3 for i in range(100):
----> 4     id1,id2=re.match('^[a-zA-Z]* ',title_list[i]).span()
      5     list_titles.append(title_list[i][id1:id2])

AttributeError: 'NoneType' object has no attribute 'span'
```

In [31]:
```
#Print list of titles
for L in list_titles:
    print(L)
```

```
Top
Top
Top
Top
```

Connect to the Twitter API and do a simple data pull

In [32]:
```
import twitter
```

In [37]:
```
#assign api
api = twitter.Api(consumer_key='oquIbXRnMhxYLAQMijo0dJ5WP',
                  consumer_secret='IKDwmxOvOw4dghT9WnrnVbqmEUYjD93NFS5ViBIdsKkZDSKdTn',
                  access_token_key='1524527501107732481-yzB0h6VJCS9kwTTPeRH87SBPO4AVIJ',
                  access_token_secret='wYL9A6LIyKUwi4HBKFwOrYNt3FXOea2Dt1pAA9cFiLYYx')
```

In [39]:
```
api.VerifyCredentials()
```

Out[39]:
```
User(ID=1524527501107732481, ScreenName=AJordan0211)
```

In [40]:
```
api.GetSearch(term='Bellevue University', since=2022-6-1, count=10)
```

Out[40]:
```
[Status(ID=1560315278168399875, ScreenName=seattletimes, Created=Thu Aug 18 17:18:46 +0000 2022, Text='A University
of Washington professor reported what officials believe is the first confirmed detection of the Atlas… https://t.co/
YN6oPSuMmO'),
 Status(ID=1560099279158534144, ScreenName=KIRO7Seattle, Created=Thu Aug 18 03:00:28 +0000 2022, Text='A University
of Washington professor initially reported a sighting of the atlas moth, which can have a wingspan of… https://t.co/
dJaqqO6Sjr'),
 Status(ID=1560332441944047622, ScreenName=FroDiavolo, Created=Thu Aug 18 18:26:58 +0000 2022, Text='RT @seattletime
s: A University of Washington professor reported what officials believe is the first confirmed detection of the Atla
s moth i…'),
 Status(ID=1560329508200230912, ScreenName=jschickle, Created=Thu Aug 18 18:15:18 +0000 2022, Text='RT @seattletime
s: A University of Washington professor reported what officials believe is the first confirmed detection of the Atla
s moth i…'),
 Status(ID=1560326115788349440, ScreenName=journal_court, Created=Thu Aug 18 18:01:50 +0000 2022, Text='@pureblood55
@BenC137Helton @DeAngelisCorey I can understand. My kids were raised in Bellevue WA where the public s… https://t.co
/RGNxo8fX3t'),
 Status(ID=1560324196529479683, ScreenName=CitizenFront, Created=Thu Aug 18 17:54:12 +0000 2022, Text='RT @seattleti
mes: A University of Washington professor reported what officials believe is the first confirmed detection of the At
las moth i…'),
 Status(ID=1560322550810308608, ScreenName=vpkeenan, Created=Thu Aug 18 17:47:40 +0000 2022, Text='RT @seattletimes:
A University of Washington professor reported what officials believe is the first confirmed detection of the Atlas m
oth i…'),
 Status(ID=1560319548212985856, ScreenName=sequoia2001, Created=Thu Aug 18 17:35:44 +0000 2022, Text='RT @seattletim
es: A University of Washington professor reported what officials believe is the first confirmed detection of the Atl
as moth i…'),
 Status(ID=1560319206918303745, ScreenName=breen_eye, Created=Thu Aug 18 17:34:22 +0000 2022, Text='RT @seattletime
s: A University of Washington professor reported what officials believe is the first confirmed detection of the Atla
s moth i…'),
 Status(ID=1560319020082925568, ScreenName=usustainme, Created=Thu Aug 18 17:33:38 +0000 2022, Text='RT @seattletime
s: A University of Washington professor reported what officials believe is the first confirmed detection of the Atla
s moth i…')]
```

In [41]:
```
api.GetSearch(term='Data Science', since=2022-8-1, count=10)
```

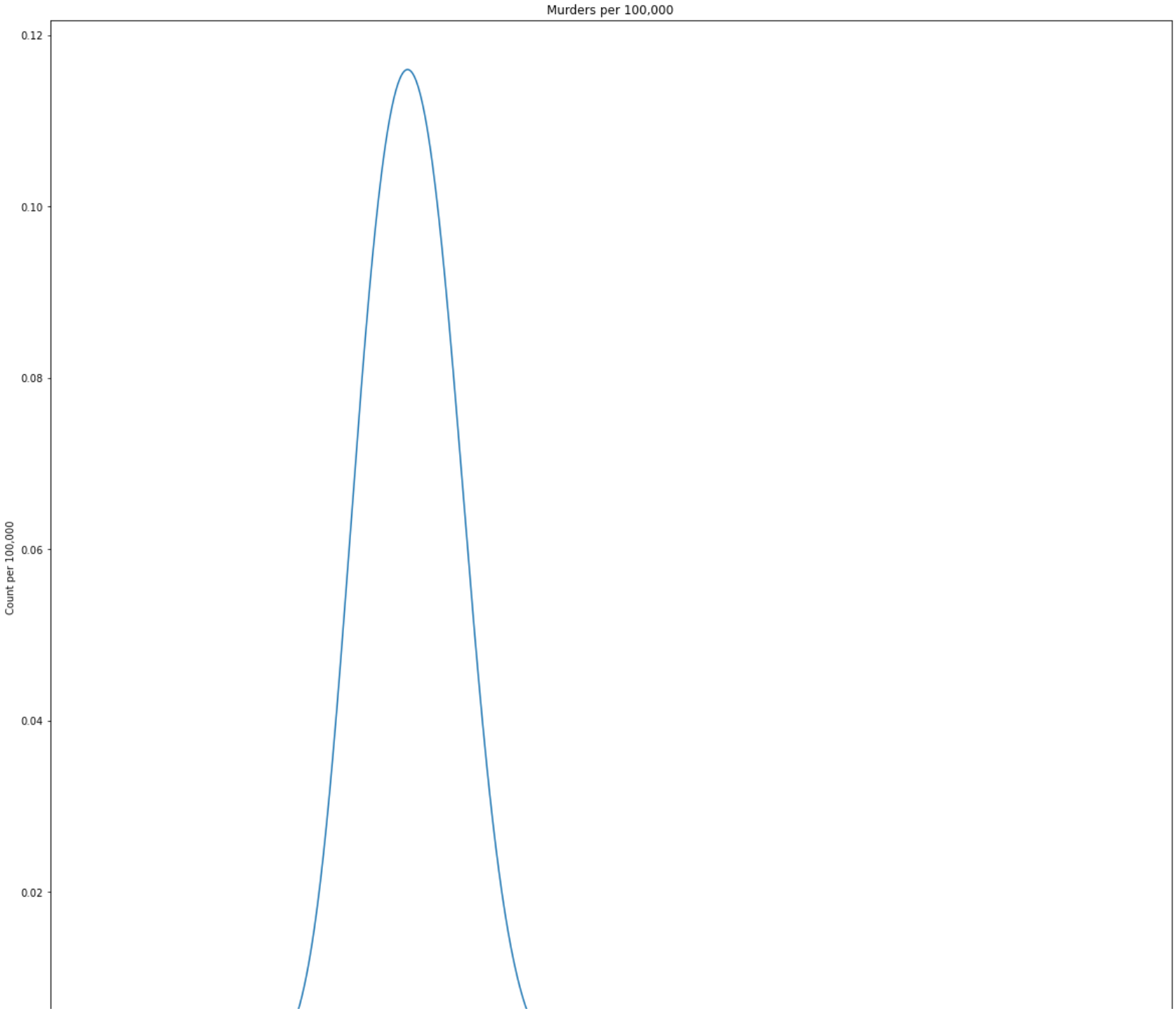
Out[41]:
```
[Status(ID=1559797262678720514, ScreenName=MRobertsQLD, Created=Wed Aug 17 07:00:21 +0000 2022, Text='The "Science"
(TM) behind the supposed climate crisis simply doesn\'t stack up. \n\nWhen you look underneath the "expe… https://t.
co/s36X2YSuD2'),
 Status(ID=1559732116346310656, ScreenName=MartyMakary, Created=Wed Aug 17 02:41:29 +0000 2022, Text="Dr. Jha just s
aid “it's going to be really important that people this fall and winter, get the new shot.”\n\nBut we’v… https://t.c
o/A7v87v86Uk"),
 Status(ID=1559970845736452098, ScreenName=AP, Created=Wed Aug 17 18:30:07 +0000 2022, Text='The Centers for Disease
Control and Prevention director plans to shake up the organization with changes intended to… https://t.co/gKP9LGWTr9
'),
 Status(ID=1560333700029526016, ScreenName=arXiv_Daily, Created=Thu Aug 18 18:31:58 +0000 2022, Text='RT @Deep__AI:
From the Machine Learning &amp;amp; Data Science glossary: Quantum Computation Theory https://t.co/ptxThtPo0H #Probabili
ty #QuantumCo…'),
 Status(ID=1560333653783330819, ScreenName=slamzito1981, Created=Thu Aug 18 18:31:47 +0000 2022, Text='RT @avikumart
_: Youtube is the best source to learn data science and machine learning for those who prefer video-based learning📈
👹\n\nHere are…'),
 Status(ID=1560333620304179200, ScreenName=Scatter_Cushion, Created=Thu Aug 18 18:31:39 +0000 2022, Text='RT @ki_irv
ing: My final story interning with @NewsfromScience and @ScienceCareers! I had an amazing time chatting with @mona_m
inkara and tw…'),
 Status(ID=1560333581087563776, ScreenName=hardayborlah1, Created=Thu Aug 18 18:31:29 +0000 2022, Text='RT @avikumar
t_: Youtube is the best source to learn data science and machine learning for those who prefer video-based learning
📈👹\n\nHere are…'),
 Status(ID=1560333524229623810, ScreenName=chris_mieke, Created=Thu Aug 18 18:31:16 +0000 2022, Text='RT @CassavaSci
ences: $SAVA\n\nNo Evidence of Data Manipulation in Science Publication on Simufilam\n\nhttps://t.co/vFK78L78C6'),
 Status(ID=1560333505812480000, ScreenName=hoeve_jeroen, Created=Thu Aug 18 18:31:12 +0000 2022, Text='RT @MRobertsQ
LD: The "Science" (TM) behind the supposed climate crisis simply doesn\'t stack up. \n\nWhen you look underneath the
"experts" hi…'),
 Status(ID=1560333431980146696, ScreenName=fadaresamuel_, Created=Thu Aug 18 18:30:54 +0000 2022, Text='The greatest
mistake you will be making in this Data Analytical journey is trying to be the best at every Data Anal… https://t.co
/gH1bZ5nOIB')]
```

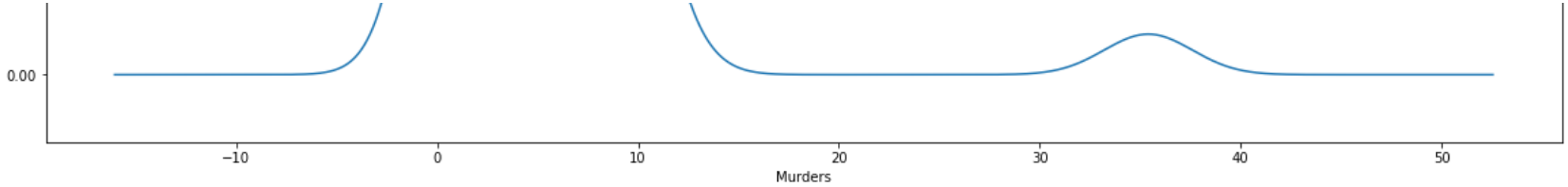
Using one of the datasets provided, or a dataset of your own, choose 3 of the following visualizations to complete. You must submit via PDF along with your code. You are free to use Matplotlib, Seaborn or another package if you prefer.

Density Plot

In [53]:
```
#Load data
crime = pd.read_csv("data/crimerates-by-state-2005.csv")
```

In [52]:
```
#Create density plot
plt.figure(figsize=(20,20))
crime['murder'].plot.kde()
plt.title('Murders per 100,000')
plt.xlabel('Murders')
plt.ylabel('Count per 100,000')
plt.show()
```

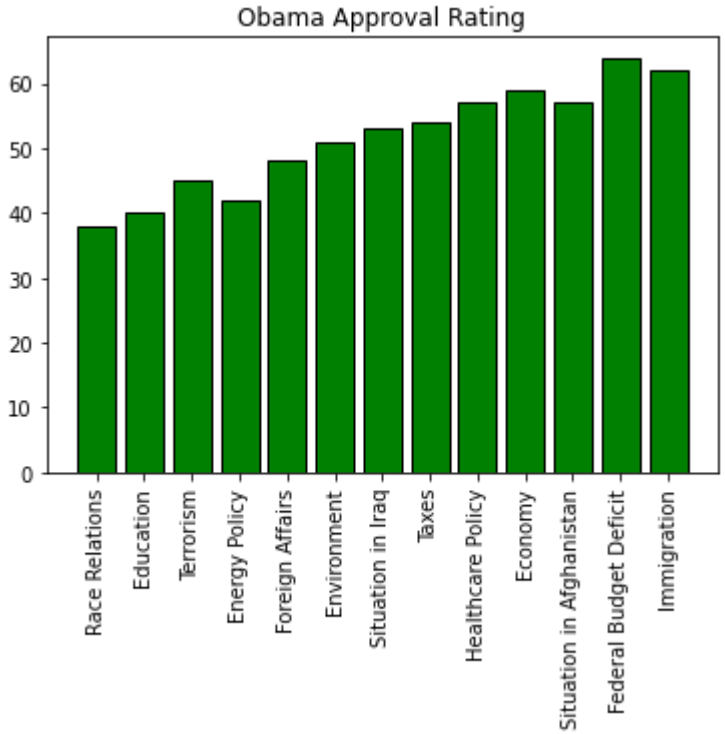

Murders per 100,000
Count per 100,000
0.12
0.10
0.08
0.06
0.04
0.02



Bar Chart

In [56]:
```
#Load data
obamaDF = pd.read_excel('data/obama-approval-ratings.xls')
```

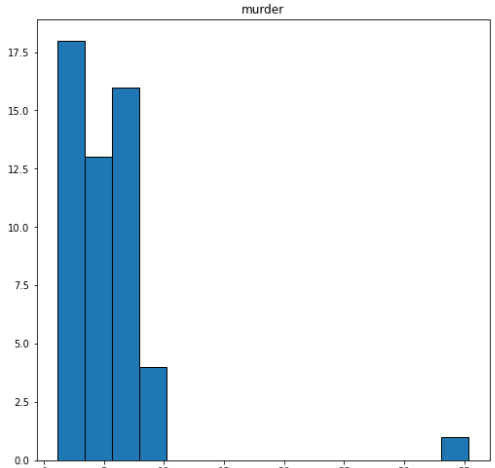
In [59]:
```
#Create bar chart
plt.bar(obamaDF.Issue, obamaDF.Disapprove, color='green', edgecolor='black')
plt.title('Obama Approval Rating')
plt.xticks(rotation=90)
plt.show()
```

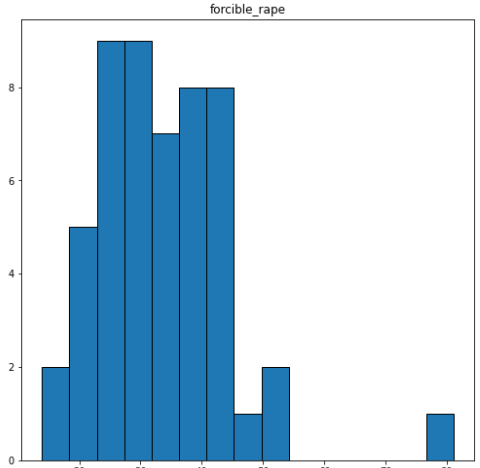


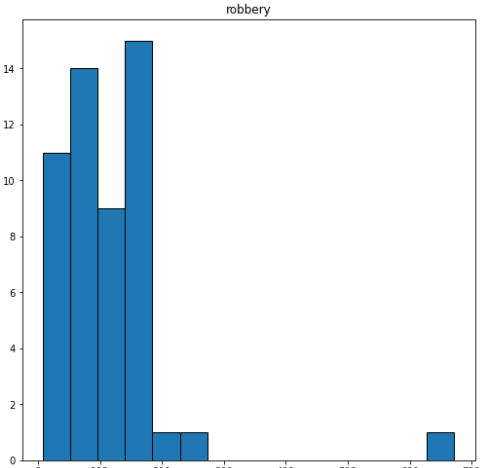
Histogram

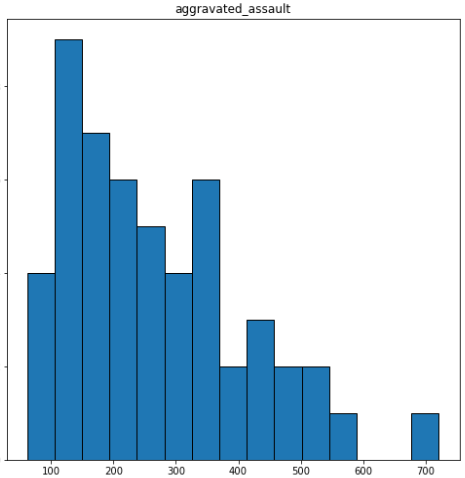
In [60]:
```
#Load data
crime = pd.read_csv('data/crimeratesbystate-formatted.csv')
```

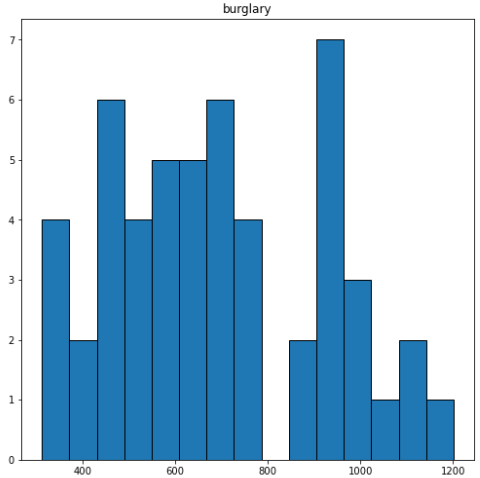
In [61]:
```
#Create histograms
crime.hist(bins = 15, edgecolor = "black", linewidth = 1.0, xlabelsize = 10, ylabelsize = 10,
           grid = False, figsize = (30,30))
plt.show()
```

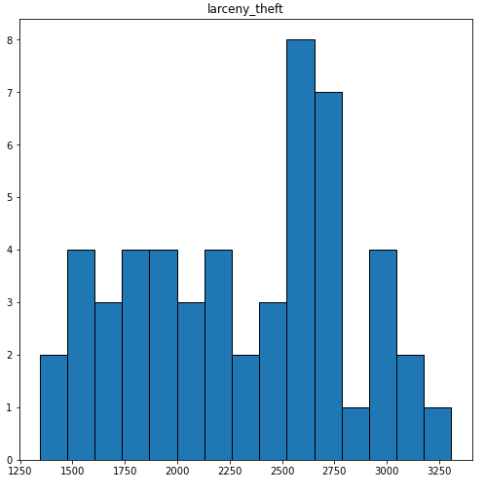

murder

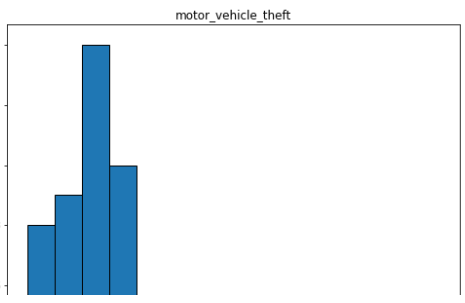

forcible_rape

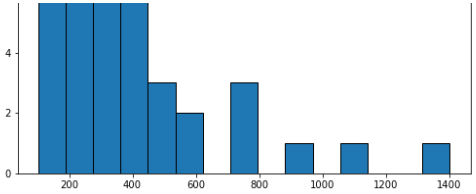

robbery


aggravated_assault


burglary


larceny_theft


motor_vehicle_theft


4
2
0
200
400
600
800
1000
1200
1400