DSC540-T301_2237-1_Project_Milestone-3_Samanta_Rajib

July 17, 2023

[81]:
```
# Class : DSC540-T301 Data Preparation (2237-1)
# Name : Rajib Samanta
# Assignment : Project Milestone 3
## Assignment: Cleaning/Formatting Flat File Source
## Project: Data Exploration on NYPD Arrest Data
## Name: Rajib Samanta
#*** As the original data source : https://maps2.dcgis.dc.gov/dcgis/services/
 ↪DCGIS_DATA/Public_Safety_WebMercator/MapServer/WMSServer?
 ↪request=GetCapabilities&service=WMS
#        is not in html format, I didnt find any html data source for␣
 ↪'Marijuana Arrests(D.C)''
#        Changing the data similar arrest data source ***


# Overview
## This is a breakdown of every arrest effected in NYC by the NYPD during the␣
 ↪current year.
## This data is manually extracted every quarter and reviewed by the Office of␣
 ↪Management Analysis and Planning.
## Each record represents an arrest effected in NYC by the NYPD and includes␣
 ↪information about the type of crime, the location and time of enforcement.
```

[82]:
```
import requests
from bs4 import BeautifulSoup
import urllib.request
from urllib.request import urlopen
import matplotlib.pyplot as plt
from fuzzywuzzy import fuzz
from fuzzywuzzy import process
```

[83]:
```
# URL of the web page
url = "https://data.cityofnewyork.us/Public-Safety/
 ↪NYPD-Arrest-Data-Year-to-Date-/uip8-fykc"
# Send a GET request to the URL
#response = requests.get(url)
```

```python
# Send a GET request to the URL
response = requests.get(url)
#print(response.text)

# Parse the HTML content using BeautifulSoup
soup = BeautifulSoup(response.content, 'html.parser')
containers = soup.findAll("div", { "class": "ui celled sortable table"})
print(len(containers))

table_captions = soup.find_all('caption')
print(table_captions)
'''
# Print the page title
title = soup.title.string
print("Page Title:", title)
containers = soup.findAll("section", { "class": "landing-page-section␣
 ↪dataset-preview"})
#print(soup)
# Find the div element by its class
div_element = soup.find("div", {"class": "table-contents"})

# Check if the div element is found
if div_element:
    # Extract the data from the div element
    data = div_element.get_text()

    # Print the extracted data
    print(data)
else:
    print("Div element not found.")

# Create a BeautifulSoup object to parse the HTML content
#soup = BeautifulSoup(response.text, "html.parser")
containers = page_soup.findAll("div", { "class": "visualization-content"})
print(len(containers))

# Find the table element by its class or other identifiers
table = soup.find("table", {"class": "socrata-table frozen-columns"})

# Check if the table is found
if table:
    # Extract the table headers
    headers = [header.text.strip() for header in table.find_all("th")]

    # Extract the table rows
    rows = []
    for row in table.find_all("tr"):
        rows.append([cell.text.strip() for cell in row.find_all("td")])

    # Print the table headers
    print("Headers:")
    print(headers)

    # Print the table rows
    print("Rows:")
    for row in rows:
        print(row)
else:
    print("Table not found.")'''
```

```
0
[]
```

[83]:
```
'\n# Print the page title\ntitle = soup.title.string\nprint("Page Title:",
title)\ncontainers = soup.findAll("section", { "class": "landing-page-section
dataset-preview"})\n#print(soup)\n# Find the div element by its
class\ndiv_element = soup.find("div", {"class": "table-contents"})\n\n# Check if
the div element is found\nif div_element:\n    # Extract the data from the div
element\n    data = div_element.get_text()\n\n    # Print the extracted data\n
print(data)\nelse:\n    print("Div element not found.")\n\n# Create a
BeautifulSoup object to parse the HTML content\n#soup =
BeautifulSoup(response.text, "html.parser")\ncontainers =
page_soup.findAll("div", { "class": "visualization-
content"})\nprint(len(containers))\n\n# Find the table element by its class or
other identifiers\ntable = soup.find("table", {"class": "socrata-table frozen-
columns"})\n\n# Check if the table is found\nif table:\n    # Extract the table
headers\n    headers = [header.text.strip() for header in
table.find_all("th")]\n\n    # Extract the table rows\n    rows = []\n    for
row in table.find_all("tr"):\n        rows.append([cell.text.strip() for cell in
row.find_all("td")])\n\n    # Print the table headers\n    print("Headers:")\n
print(headers)\n\n    # Print the table rows\n    print("Rows:")\n    for row in
rows:\n        print(row)\nelse:\n    print("Table not found.")'
```

[84]:
```
# Find the tables
all_tables = soup.find_all("table")
print("Total number of tables are {} ".format(len(all_tables)))
##--> There are 7 tables
```

```
Total number of tables are 0
```

[85]:
```
# **** Due to limited time and job related relocation, I didnt get time to do␣
↪more research on the above error.
## To complete the assignment redaing the same data as in csv format ***
```

[86]:
```python
import requests
import pandas as pd

# URL of the CSV file
csv_url = "https://data.cityofnewyork.us/api/views/uip8-fykc/rows.csv"

# Send a GET request to the CSV URL
response = requests.get(csv_url)

# Save response content to a file
with open("data.csv", "wb") as f:
    f.write(response.content)

print("Response content saved to data.csv")


# Read the CSV file into a pandas DataFrame
df = pd.read_csv("data.csv")

# Print the DataFrame
print(df.head())
```

```
Response content saved to data.csv
   ARREST_KEY ARREST_DATE  PD_CD             PD_DESC  KY_CD OFNS_DESC  \
0   263238742  02/08/2023  380.0  ROBBERY,CAR JACKING  105.0   ROBBERY
1   265590985  03/24/2023  155.0              RAPE 2  104.0      RAPE
2   265798132  03/28/2023  157.0              RAPE 1  104.0      RAPE
3   269233687  06/02/2023  157.0              RAPE 1  104.0      RAPE
4   270519574  06/28/2023  157.0              RAPE 1  104.0      RAPE

     LAW_CODE LAW_CAT_CD ARREST_BORO  ARREST_PRECINCT  JURISDICTION_CODE  \
0  PL 1601003          F           K               62                  0
1  PL 1303001          F           S              120                  0
2  PL 1303501          F           S              120                  0
3  PL 1303501          F           Q              110                  0
4  PL 1303501          F           K               84                  0

  AGE_GROUP PERP_SEX       PERP_RACE  X_COORD_CD  Y_COORD_CD   Latitude  \
0     25-44        F           WHITE      989904      156928  40.597407
1     18-24        M           BLACK      962873      174172  40.644721
2     25-44        M           BLACK      962873      174172  40.644721
3     25-44        M  WHITE HISPANIC     1019164      210169  40.743481
4     25-44        M  BLACK HISPANIC      988902      192641  40.695439

   Longitude                       New Georeferenced Column
0 -73.979638                POINT (-73.979638 40.597407)
1 -74.077033  POINT (-74.0770327198983 40.6447209438691)
2 -74.077033  POINT (-74.0770327198983 40.6447209438691)
```

```
3 -73.874004  POINT (-73.8740035373971 40.7434812638841)
4 -73.983225  POINT (-73.9832253756043 40.6954388081238)
```

[87]:
```
df.shape
# No of rows : 112571 and Number of columns : 19
```

[87]:
```
(112571, 19)
```

[88]:
```
# List all the columns
columns = df.columns.tolist()
# Print the column names
print(columns)
```

```
['ARREST_KEY', 'ARREST_DATE', 'PD_CD', 'PD_DESC', 'KY_CD', 'OFNS_DESC',
'LAW_CODE', 'LAW_CAT_CD', 'ARREST_BORO', 'ARREST_PRECINCT', 'JURISDICTION_CODE',
'AGE_GROUP', 'PERP_SEX', 'PERP_RACE', 'X_COORD_CD', 'Y_COORD_CD', 'Latitude',
'Longitude', 'New Georeferenced Column']
```

[89]:
```
# Get information about the DataFrame
data_info = df.info()
# Print the DataFra
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 112571 entries, 0 to 112570
Data columns (total 19 columns):
 #   Column                    Non-Null Count   Dtype
---  ------                    --------------   -----
 0   ARREST_KEY                112571 non-null  int64
 1   ARREST_DATE               112571 non-null  object
 2   PD_CD                     112110 non-null  float64
 3   PD_DESC                   112571 non-null  object
 4   KY_CD                     112105 non-null  float64
 5   OFNS_DESC                 112571 non-null  object
 6   LAW_CODE                  112571 non-null  object
 7   LAW_CAT_CD                111725 non-null  object
 8   ARREST_BORO               112571 non-null  object
 9   ARREST_PRECINCT           112571 non-null  int64
 10  JURISDICTION_CODE         112571 non-null  int64
 11  AGE_GROUP                 112571 non-null  object
 12  PERP_SEX                  112571 non-null  object
 13  PERP_RACE                 112571 non-null  object
 14  X_COORD_CD                112571 non-null  int64
 15  Y_COORD_CD                112571 non-null  int64
 16  Latitude                  112571 non-null  float64
 17  Longitude                 112571 non-null  float64
 18  New Georeferenced Column  112571 non-null  object
dtypes: float64(4), int64(5), object(10)
memory usage: 16.3+ MB
```

[90]:
```
# Find the missing values of columns
df.isnull().sum() # Sum of null value for each columns
## From the below table we can see PD_CD,KY_CD has missing values for around␣
 ↪450+ records
## We can remove these 450 records a insufficient records or bad data.
```

[90]:
```
ARREST_KEY                  0
ARREST_DATE                 0
PD_CD                     461
PD_DESC                     0
KY_CD                     466
OFNS_DESC                   0
LAW_CODE                    0
LAW_CAT_CD                846
ARREST_BORO                 0
ARREST_PRECINCT             0
JURISDICTION_CODE           0
AGE_GROUP                   0
PERP_SEX                    0
PERP_RACE                   0
X_COORD_CD                  0
Y_COORD_CD                  0
Latitude                    0
Longitude                   0
New Georeferenced Column    0
dtype: int64
```

[91]:
```
# Remove rows with null values in column CCN,RACE,ETHNICITY & SEX
df = df.dropna(subset=['PD_CD'])
df.shape
## After removing 461 rows now count is 112110, earlier was 112571
```

[91]:
```
(112110, 19)
```

[92]:
```
# data.describe
df.head()
```

[92]:
```
   ARREST_KEY ARREST_DATE  PD_CD              PD_DESC  KY_CD OFNS_DESC  \
0   263238742  02/08/2023  380.0  ROBBERY,CAR JACKING  105.0   ROBBERY
1   265590985  03/24/2023  155.0               RAPE 2  104.0      RAPE
2   265798132  03/28/2023  157.0               RAPE 1  104.0      RAPE
3   269233687  06/02/2023  157.0               RAPE 1  104.0      RAPE
4   270519574  06/28/2023  157.0               RAPE 1  104.0      RAPE

     LAW_CODE LAW_CAT_CD ARREST_BORO  ARREST_PRECINCT  JURISDICTION_CODE  \
0  PL 1601003          F           K               62                  0
1  PL 1303001          F           S              120                  0
```

```
2  PL 1303501          F           S              120                   0
3  PL 1303501          F           Q              110                   0
4  PL 1303501          F           K               84                   0

  AGE_GROUP PERP_SEX       PERP_RACE  X_COORD_CD  Y_COORD_CD   Latitude  \
0     25-44        F           WHITE      989904      156928  40.597407
1     18-24        M           BLACK      962873      174172  40.644721
2     25-44        M           BLACK      962873      174172  40.644721
3     25-44        M  WHITE HISPANIC     1019164      210169  40.743481
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0 -73.979638                POINT (-73.979638 40.597407)
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3 -73.874004  POINT (-73.8740035373971 40.7434812638841)
4 -73.983225  POINT (-73.9832253756043 40.6954388081238)
```
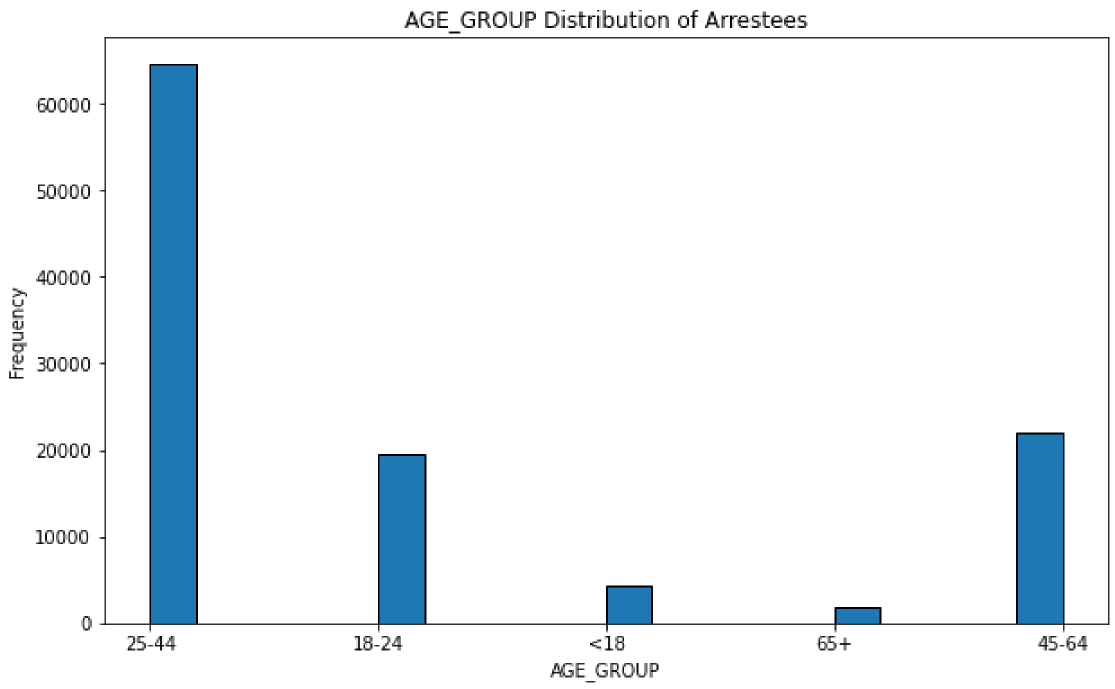
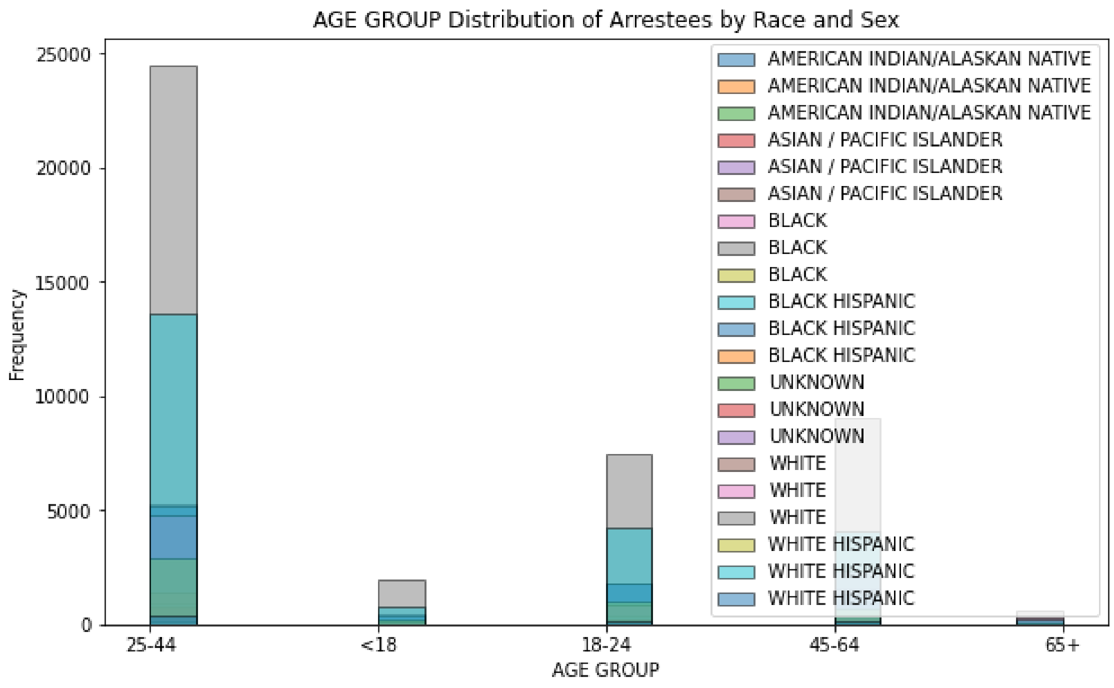

[93]:
```
# # Identify outliers
plt.figure(figsize=(10, 6))
plt.hist(df['AGE_GROUP'],edgecolor='black', bins=20)
plt.xlabel('AGE_GROUP')
plt.ylabel('Frequency')
plt.title('AGE_GROUP Distribution of Arrestees')
plt.show()
```



```
[94]: # AGE_GROUP Distribution of Arrestees by Race and Sex
      grouped = df.groupby(['PERP_RACE', 'PERP_SEX'])
      plt.figure(figsize=(10, 6))
      for group, data1 in grouped:
          plt.hist(data1['AGE_GROUP'], bins=20,edgecolor='black', alpha=0.5,␣
       ↪label=group)
      plt.xlabel('AGE GROUP')
      plt.ylabel('Frequency')
      plt.title('AGE GROUP Distribution of Arrestees by Race and Sex')
      plt.legend()
      plt.show()
```

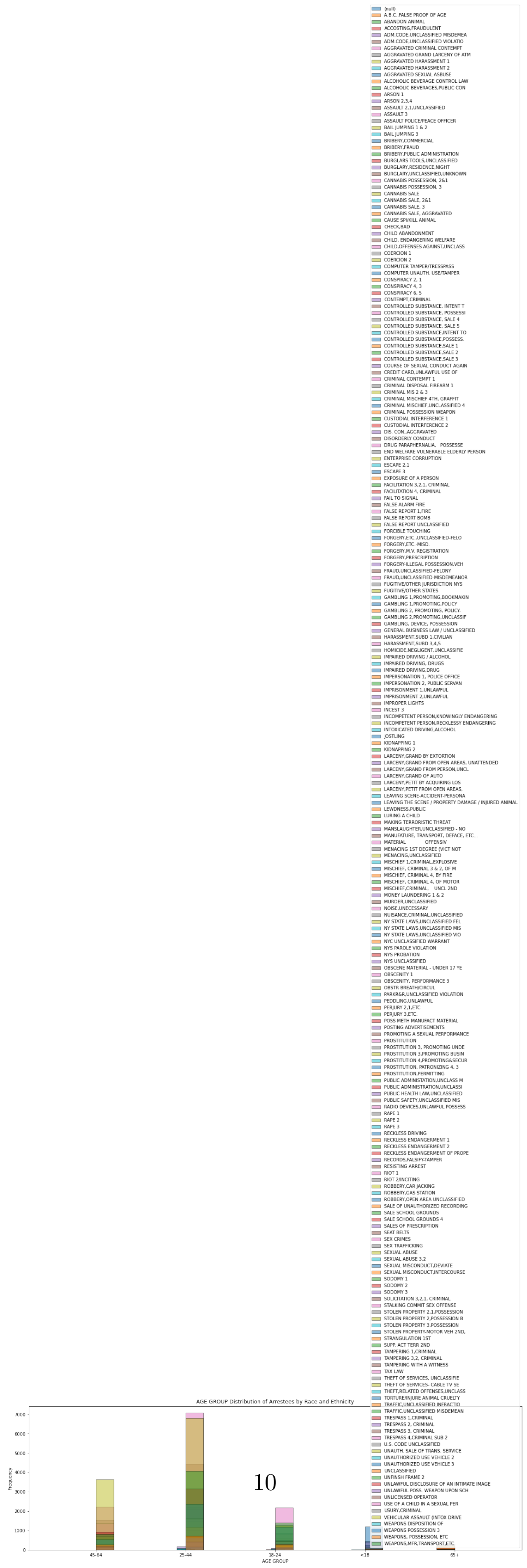


```
[95]: # add additional calculated column to calculate the yearwise arrest data
      df['ARREST_DATE'] = pd.to_datetime(df['ARREST_DATE'])  # Convert the column to␣
       ↪datetime if not already done

      # Extract the year from the datetime column
      df['YEAR'] = df['ARREST_DATE'].dt.year
      df.head()
```

```
[95]:    ARREST_KEY ARREST_DATE  PD_CD              PD_DESC  KY_CD OFNS_DESC  \
      0   263238742  2023-02-08  380.0  ROBBERY,CAR JACKING  105.0   ROBBERY
      1   265590985  2023-03-24  155.0               RAPE 2  104.0      RAPE
```

```
2   265798132  2023-03-28  157.0              RAPE 1  104.0      RAPE
3   269233687  2023-06-02  157.0              RAPE 1  104.0      RAPE
4   270519574  2023-06-28  157.0              RAPE 1  104.0      RAPE

     LAW_CODE LAW_CAT_CD ARREST_BORO  ARREST_PRECINCT  JURISDICTION_CODE  \
0  PL 1601003          F           K               62                  0
1  PL 1303001          F           S              120                  0
2  PL 1303501          F           S              120                  0
3  PL 1303501          F           Q              110                  0
4  PL 1303501          F           K               84                  0

  AGE_GROUP PERP_SEX       PERP_RACE  X_COORD_CD  Y_COORD_CD   Latitude  \
0     25-44        F           WHITE      989904      156928  40.597407
1     18-24        M           BLACK      962873      174172  40.644721
2     25-44        M           BLACK      962873      174172  40.644721
3     25-44        M  WHITE HISPANIC     1019164      210169  40.743481
4     25-44        M  BLACK HISPANIC      988902      192641  40.695439

   Longitude                   New Georeferenced Column  YEAR
0 -73.979638              POINT (-73.979638 40.597407)  2023
1 -74.077033  POINT (-74.0770327198983 40.6447209438691)  2023
2 -74.077033  POINT (-74.0770327198983 40.6447209438691)  2023
3 -73.874004  POINT (-73.8740035373971 40.7434812638841)  2023
4 -73.983225  POINT (-73.9832253756043 40.6954388081238)  2023
```

[96]:
```python
# Age Distribution of Arrestees TYPE
grouped = df.groupby(['PD_DESC'])
plt.figure(figsize=(20, 6))
for group, data1 in grouped:
    plt.hist(data1['AGE_GROUP'], bins=20,edgecolor='black', alpha=0.5,␣
 ↪label=group)
plt.xlabel('AGE GROUP')
plt.ylabel('Frequency')
plt.title('AGE GROUP Distribution of Arrestees by Race and Ethnicity')
plt.legend()
plt.show()
```


AGE GROUP Distribution of Arrestees by Race and Ethnicity
Frequency
0
1000
2000
3000
4000
5000
6000
7000
45-64
25-44
18-24
<18
65+
AGE GROUP
(null)
A.B.C.,FALSE PROOF OF AGE
ABANDON ANIMAL
ACCOSTING,FRAUDULENT
ADM.CODE,UNCLASSIFIED MISDEMEA
ADM.CODE,UNCLASSIFIED VIOLATIO
AGGRAVATED CRIMINAL CONTEMPT
AGGRAVATED GRAND LARCENY OF ATM
AGGRAVATED HARASSMENT 1
AGGRAVATED HARASSMENT 2
AGGRAVATED SEXUAL ASBUSE
ALCOHOLIC BEVERAGE CONTROL LAW
ALCOHOLIC BEVERAGES,PUBLIC CON
ARSON 1
ARSON 2,3,4
ASSAULT 2,1,UNCLASSIFIED
ASSAULT 3
ASSAULT POLICE/PEACE OFFICER
BAIL JUMPING 1 & 2
BAIL JUMPING 3
BRIBERY,COMMERCIAL
BRIBERY,FRAUD
BRIBERY,PUBLIC ADMINISTRATION
BURGLARS TOOLS,UNCLASSIFIED
BURGLARY,RESIDENCE,NIGHT
BURGLARY,UNCLASSIFIED,UNKNOWN
CANNABIS POSSESSION, 2&1
CANNABIS POSSESSION, 3
CANNABIS SALE
CANNABIS SALE, 2&1
CANNABIS SALE, 3
CANNABIS SALE, AGGRAVATED
CAUSE SPI/KILL ANIMAL
CHECK,BAD
CHILD ABANDONMENT
CHILD, ENDANGERING WELFARE
CHILD,OFFENSES AGAINST,UNCLASS
COERCION 1
COERCION 2
COMPUTER TAMPER/TRESSPASS
COMPUTER UNAUTH. USE/TAMPER
CONSPIRACY 2, 1
CONSPIRACY 4, 3
CONSPIRACY 6, 5
CONTEMPT,CRIMINAL
CONTROLLED SUBSTANCE, INTENT T
CONTROLLED SUBSTANCE, POSSESSI
CONTROLLED SUBSTANCE, SALE 4
CONTROLLED SUBSTANCE, SALE 5
CONTROLLED SUBSTANCE,INTENT TO
CONTROLLED SUBSTANCE,POSSESS.
CONTROLLED SUBSTANCE,SALE 1
CONTROLLED SUBSTANCE,SALE 2
CONTROLLED SUBSTANCE,SALE 3
COURSE OF SEXUAL CONDUCT AGAIN
CREDIT CARD,UNLAWFUL USE OF
CRIMINAL CONTEMPT 1
CRIMINAL DISPOSAL FIREARM 1
CRIMINAL MIS 2 & 3
CRIMINAL MISCHIEF 4TH, GRAFFIT
CRIMINAL MISCHIEF,UNCLASSIFIED 4
CRIMINAL POSSESSION WEAPON
CUSTODIAL INTERFERENCE 1
CUSTODIAL INTERFERENCE 2
DIS. CON.,AGGRAVATED
DISORDERLY CONDUCT
DRUG PARAPHERNALIA, POSSESSE
END WELFARE VULNERABLE ELDERLY PERSON
ENTERPRISE CORRUPTION
ESCAPE 2,1
ESCAPE 3
EXPOSURE OF A PERSON
FACILITATION 3,2,1, CRIMINAL
FACILITATION 4, CRIMINAL
FAIL TO SIGNAL
FALSE ALARM FIRE
FALSE REPORT 1,FIRE
FALSE REPORT BOMB
FALSE REPORT UNCLASSIFIED
FORCIBLE TOUCHING
FORGERY,ETC.,UNCLASSIFIED-FELO
FORGERY,ETC.-MISD.
FORGERY,M.V. REGISTRATION
FORGERY,PRESCRIPTION
FORGERY-ILLEGAL POSSESSION,VEH
FRAUD,UNCLASSIFIED-FELONY
FRAUD,UNCLASSIFIED-MISDEMEANOR
FUGITIVE/OTHER JURISDICTION NYS
FUGITIVE/OTHER STATES
GAMBLING 1,PROMOTING,BOOKMAKIN
GAMBLING 1,PROMOTING,POLICY
GAMBLING 2, PROMOTING, POLICY-
GAMBLING 2,PROMOTING,UNCLASSIF
GAMBLING, DEVICE, POSSESSION
GENERAL BUSINESS LAW / UNCLASSIFIED
HARASSMENT,SUBD 1,CIVILIAN
HARASSMENT,SUBD 3,4,5
HOMICIDE,NEGLIGENT,UNCLASSIFIE
IMPAIRED DRIVING / ALCOHOL
IMPAIRED DRIVING, DRUGS
IMPAIRED DRIVING,DRUG
IMPERSONATION 1, POLICE OFFICE
IMPERSONATION 2, PUBLIC SERVAN
IMPRISONMENT 1,UNLAWFUL
IMPRISONMENT 2,UNLAWFUL
IMPROPER LIGHTS
INCEST 3
INCOMPETENT PERSON,KNOWINGLY ENDANGERING
INCOMPETENT PERSON,RECKLESSY ENDANGERING
INTOXICATED DRIVING,ALCOHOL
JOSTLING
KIDNAPPING 1
KIDNAPPING 2
LARCENY,GRAND BY EXTORTION
LARCENY,GRAND FROM OPEN AREAS, UNATTENDED
LARCENY,GRAND FROM PERSON,UNCL
LARCENY,GRAND OF AUTO
LARCENY,PETIT BY ACQUIRING LOS
LARCENY,PETIT FROM OPEN AREAS,
LEAVING SCENE-ACCIDENT-PERSONA
LEAVING THE SCENE / PROPERTY DAMAGE / INJURED ANIMAL
LEWDNESS,PUBLIC
LURING A CHILD
MAKING TERRORISTIC THREAT
MANSLAUGHTER,UNCLASSIFIED - NO
MANUFACTURE, TRANSPORT, DEFACE, ETC...
MATERIAL OFFENSIV
MENACING 1ST DEGREE (VICT NOT
MENACING,UNCLASSIFIED
MISCHIEF 1,CRIMINAL,EXPLOSIVE
MISCHIEF, CRIMINAL 3 & 2, OF M
MISCHIEF, CRIMINAL 4, BY FIRE
MISCHIEF, CRIMINAL 4, OF MOTOR
MISCHIEF,CRIMINAL, UNCL 2ND
MONEY LAUNDERING 1 & 2
MURDER,UNCLASSIFIED
NOISE,UNECESSARY
NUISANCE,CRIMINAL,UNCLASSIFIED
NY STATE LAWS,UNCLASSIFIED FEL
NY STATE LAWS,UNCLASSIFIED MIS
NY STATE LAWS,UNCLASSIFIED VIO
NYC UNCLASSIFIED WARRANT
NYS PAROLE VIOLATION
NYS PROBATION
NYS UNCLASSIFIED
OBSCENE MATERIAL - UNDER 17 YE
OBSCENITY 1
OBSCENITY, PERFORMANCE 3
OBSTR BREATH/CIRCUL
PARKR&R,UNCLASSIFIED VIOLATION
PEDDLING,UNLAWFUL
PERJURY 2,1,ETC
PERJURY 3,ETC.
POSS METH MANUFACT MATERIAL
POSTING ADVERTISEMENTS
PROMOTING A SEXUAL PERFORMANCE
PROSTITUTION
PROSTITUTION 3, PROMOTING UNDE
PROSTITUTION 3,PROMOTING BUSIN
PROSTITUTION 4,PROMOTING&SECUR
PROSTITUTION, PATRONIZING 4, 3
PROSTITUTION,PERMITTING
PUBLIC ADMINISTRATION,UNCLASS M
PUBLIC ADMINISTRATION,UNCLASSI
PUBLIC HEALTH LAW,UNCLASSIFIED
PUBLIC SAFETY,UNCLASSIFIED MIS
RADIO DEVICES,UNLAWFUL POSSESS
RAPE 1
RAPE 2
RAPE 3
RECKLESS DRIVING
RECKLESS ENDANGERMENT 1
RECKLESS ENDANGERMENT 2
RECKLESS ENDANGERMENT OF PROPE
RECORDS,FALSIFY-TAMPER
RESISTING ARREST
RIOT 1
RIOT 2/INCITING
ROBBERY,CAR JACKING
ROBBERY,GAS STATION
ROBBERY,OPEN AREA UNCLASSIFIED
SALE OF UNAUTHORIZED RECORDING
SALE SCHOOL GROUNDS
SALE SCHOOL GROUNDS 4
SALES OF PRESCRIPTION
SEAT BELTS
SEX CRIMES
SEX TRAFFICKING
SEXUAL ABUSE
SEXUAL ABUSE 3,2
SEXUAL MISCONDUCT,DEVIATE
SEXUAL MISCONDUCT,INTERCOURSE
SODOMY 1
SODOMY 2
SODOMY 3
SOLICITATION 3,2,1, CRIMINAL
STALKING COMMIT SEX OFFENSE
STOLEN PROPERTY 2,1,POSSESSION
STOLEN PROPERTY 2,POSSESSION B
STOLEN PROPERTY 3,POSSESSION
STOLEN PROPERTY-MOTOR VEH 2ND,
STRANGULATION 1ST
SUPP. ACT TERR 2ND
TAMPERING 1,CRIMINAL
TAMPERING 3,2, CRIMINAL
TAMPERING WITH A WITNESS
TAX LAW
THEFT OF SERVICES, UNCLASSIFIE
THEFT OF SERVICES- CABLE TV SE
THEFT,RELATED OFFENSES,UNCLASS
TORTURE/INJURE ANIMAL CRUELTY
TRAFFIC,UNCLASSIFIED INFRACTIO
TRAFFIC,UNCLASSIFIED MISDEMEAN
TRESPASS 1,CRIMINAL
TRESPASS 2, CRIMINAL
TRESPASS 3, CRIMINAL
TRESPASS 4,CRIMINAL SUB 2
U.S. CODE UNCLASSIFIED
UNAUTH. SALE OF TRANS. SERVICE
UNAUTHORIZED USE VEHICLE 2
UNAUTHORIZED USE VEHICLE 3
UNCLASSIFIED
UNFINSH FRAME 2
UNLAWFUL DISCLOSURE OF AN INTIMATE IMAGE
UNLAWFUL POSS. WEAPON UPON SCH
UNLICENSED OPERATOR
USE OF A CHILD IN A SEXUAL PER
USURY,CRIMINAL
VEHICULAR ASSAULT (INTOX DRIVE
WEAPONS DISPOSITION OF
WEAPONS POSSESSION 3
WEAPONS, POSSESSION, ETC
WEAPONS,MFR,TRANSPORT,ETC.

[97]:
```
## --> From the above plots we can say that above 65+  years person arrest␣
 ↪records are minimal but we cannot ignore
##   as it may be significant. So considering there is no outlier
```

[98]:
```
# Fix casing or inconsistent values
# Convert all values in the 'Name' column to lowercase
# Capitalize the first letter of each value in the 'Name' column
df['PD_DESC'] = df['PD_DESC'].str.capitalize()

#df
```

[99]:
```
# Now get distnct offense type for the column_name =OFNS_DESC
distinct_values = df['OFNS_DESC'].unique()
# Print distinct values
print(distinct_values)
```

```
['ROBBERY' 'RAPE' 'FELONY ASSAULT' 'ARSON' 'SEX CRIMES' 'JOSTLING'
 '(null)' 'BURGLARY' "BURGLAR'S TOOLS" 'DANGEROUS WEAPONS'
 'OTHER OFFENSES RELATED TO THEF' 'CRIMINAL MISCHIEF & RELATED OF'
 'OFF. AGNST PUB ORD SENSBLTY &' 'POSSESSION OF STOLEN PROPERTY'
 'VEHICLE AND TRAFFIC LAWS' 'CRIMINAL TRESPASS' 'PETIT LARCENY'
 'MISCELLANEOUS PENAL LAW' 'DANGEROUS DRUGS'
 'MURDER & NON-NEGL. MANSLAUGHTE' 'ASSAULT 3 & RELATED OFFENSES'
 'OFFENSES INVOLVING FRAUD' 'OTHER TRAFFIC INFRACTION' 'GRAND LARCENY'
 'INTOXICATED & IMPAIRED DRIVING' 'FORGERY'
 'OFFENSES AGAINST PUBLIC ADMINI' 'PROSTITUTION & RELATED OFFENSES'
 'GRAND LARCENY OF MOTOR VEHICLE' 'NYS LAWS-UNCLASSIFIED FELONY'
 'OTHER STATE LAWS (NON PENAL LA' 'OFFENSES AGAINST THE PERSON'
 'FOR OTHER AUTHORITIES' 'UNAUTHORIZED USE OF A VEHICLE'
 'ALCOHOLIC BEVERAGE CONTROL LAW' 'ENDAN WELFARE INCOMP' 'FRAUDS'
 'OFFENSES AGAINST PUBLIC SAFETY' 'INTOXICATED/IMPAIRED DRIVING'
 'ANTICIPATORY OFFENSES' 'OTHER STATE LAWS' 'ADMINISTRATIVE CODE'
 'CANNABIS RELATED OFFENSES' 'THEFT-FRAUD' 'FRAUDULENT ACCOSTING'
 'GAMBLING' 'HARRASSMENT 2' 'THEFT OF SERVICES'
 'UNLAWFUL POSS. WEAP. ON SCHOOL' 'AGRICULTURE & MRKTS LAW-UNCLASSIFIED'
 'OFFENSES RELATED TO CHILDREN' 'DISORDERLY CONDUCT' 'FELONY SEX CRIMES'
 'HOMICIDE-NEGLIGENT,UNCLASSIFIE' 'KIDNAPPING & RELATED OFFENSES'
 'ESCAPE 3' 'ADMINISTRATIVE CODES' 'CHILD ABANDONMENT/NON SUPPORT'
 'MOVING INFRACTIONS' 'OTHER STATE LAWS (NON PENAL LAW)'
 'DISRUPTION OF A RELIGIOUS SERV' 'KIDNAPPING' 'PARKING OFFENSES']
```

[100]:
```
## Now we are going to analyze the data for 'CANNABIS RELATED OFFENSES'
filtered_df = df[df['OFNS_DESC'] == 'CANNABIS RELATED OFFENSES']

# Print the filtered DataFrame
```

```
filtered_df.head()
```

```
[100]:       ARREST_KEY ARREST_DATE  PD_CD                   PD_DESC  KY_CD  \
1023   263379671  2023-02-10  581.0           Cannabis sale, 3  250.0
3861   269916996  2023-06-15  581.0           Cannabis sale, 3  250.0
5192   262995087  2023-02-03  578.0     Cannabis possession, 3  250.0
6272   266657456  2023-04-13  578.0     Cannabis possession, 3  250.0
6748   262846810  2023-02-01  579.0  Cannabis possession, 2&1  250.0

                     OFNS_DESC    LAW_CODE LAW_CAT_CD ARREST_BORO  \
1023  CANNABIS RELATED OFFENSES  PL 2225001          M           M
3861  CANNABIS RELATED OFFENSES  PL 2225001          M           Q
5192  CANNABIS RELATED OFFENSES  PL 2223001          M           Q
6272  CANNABIS RELATED OFFENSES  PL 2223001          M           M
6748  CANNABIS RELATED OFFENSES  PL 2223502          F           Q

      ARREST_PRECINCT  JURISDICTION_CODE AGE_GROUP PERP_SEX  \
1023               28                  0     25-44        M
3861              110                  0     25-44        M
5192              102                  0     18-24        M
6272               28                  0     18-24        F
6748              103                  0     18-24        F

                     PERP_RACE  X_COORD_CD  Y_COORD_CD   Latitude  Longitude  \
1023                     BLACK      997602      230430  40.799146 -73.951772
3861  ASIAN / PACIFIC ISLANDER     1016572      210045  40.743143 -73.883354
5192            WHITE HISPANIC     1029403      193205  40.696865 -73.837165
6272            WHITE HISPANIC      999788      233328  40.807094 -73.943873
6748                     BLACK     1040224      191374  40.691777 -73.798154

             New Georeferenced Column  YEAR
1023      POINT (-73.951772 40.799146)  2023
3861      POINT (-73.883354 40.743143)  2023
5192  POINT (-73.83716543 40.69686463)  2023
6272      POINT (-73.943873 40.807094)  2023
6748      POINT (-73.798154 40.691777)  2023
```

```
[102]: filtered_df.shape
# No of rows : 126 and Number of columns : 20 which is very minimal compare to␣
 ↪the total arrest 112110
```

```
[102]: (126, 20)
```

```
[ ]:  # Conduct Fuzzy Matching
## conduct Fuzzy search to find out the PD_DESC='CANNABIS SALE'
# Target address to match
target_address = 'CANNABIS SALE'
```

```
# Calculate similarity scores for each address in the DataFrame
df['Similarity Score'] = df['PD_DESC'].apply(lambda x: fuzz.
 ↪ratio(target_address.lower(), x.lower()))
# Find the best match and its similarity score
best_match = process.extractOne(target_address.lower(), df['PD_DESC'].
 ↪apply(lambda x: x.lower()))
best_match_address = best_match[0]
best_match_score = best_match[1]
# Print the DataFrame and the best match
print("DataFrame:")
#print(data)
print("\nBest Match:")
print(f"Address: {best_match_address}")
print(f"Similarity Score: {best_match_score}")
```

[ ]:

```

```