```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
from sklearn.linear_model import LinearRegression
```

```
data = pd.read_csv("/content/SampleSuperstore.csv")
```

```
data.shape
```

```
(9994, 13)
```

```
data.head(10)
```

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Cate
0	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Bookc
1	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	C
2	Second Class	Corporate	United States	Los Angeles	California	90036	West	Office Supplies	L
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Furniture	T
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Office Supplies	Stc
5	Standard Class	Consumer	United States	Los Angeles	California	90032	West	Furniture	Furnisl

```
data.isnull().sum()
```

```
Ship Mode       0
Segment         0
Country         0
City            0
State           0
Postal Code     0
Region          0
Category        0
Sub-Category    0
Sales           0
Quantity        0
Discount        0
Profit          0
dtype: int64
```

```
data.isnull()
```

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Sub-Category	Sales	Quantity	Discount	Profit
0	False	False	False	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...	...	...	...	...
9989	False	False	False	False	False	False	False	False	False	False	False	False	False
9990	False	False	False	False	False	False	False	False	False	False	False	False	False
9991	False	False	False	False	False	False	False	False	False	False	False	False	False
9992	False	False	False	False	False	False	False	False	False	False	False	False	False
9993	False	False	False	False	False	False	False	False	False	False	False	False	False

9994 rows × 13 columns

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
```

```
Data columns (total 13 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   Ship Mode     9994 non-null   object 
 1   Segment       9994 non-null   object 
 2   Country       9994 non-null   object 
 3   City          9994 non-null   object 
 4   State         9994 non-null   object 
 5   Postal Code   9994 non-null   int64  
 6   Region        9994 non-null   object 
 7   Category      9994 non-null   object 
 8   Sub-Category  9994 non-null   object 
 9   Sales         9994 non-null   float64
 10  Quantity      9994 non-null   int64  
 11  Discount      9994 non-null   float64
 12  Profit        9994 non-null   float64
dtypes: float64(3), int64(2), object(8)
memory usage: 1015.1+ KB
```

```
data.info
```

```
<bound method DataFrame.info of            Ship Mode    Segment        Country             City       State  \
0       Second Class   Consumer  United States        Henderson    Kentucky   
1       Second Class   Consumer  United States        Henderson    Kentucky   
2       Second Class  Corporate  United States      Los Angeles  California   
3     Standard Class   Consumer  United States  Fort Lauderdale     Florida   
4     Standard Class   Consumer  United States  Fort Lauderdale     Florida   
...              ...        ...            ...              ...         ...   
9989    Second Class   Consumer  United States            Miami     Florida   
9990  Standard Class   Consumer  United States       Costa Mesa  California   
9991  Standard Class   Consumer  United States       Costa Mesa  California   
9992  Standard Class   Consumer  United States       Costa Mesa  California   
9993    Second Class   Consumer  United States      Westminster  California   

      Postal Code Region         Category Sub-Category     Sales  Quantity  \
0           42420  South        Furniture    Bookcases  261.9600         2   
1           42420  South        Furniture       Chairs  731.9400         3   
2           90036   West  Office Supplies       Labels   14.6200         2   
3           33311  South        Furniture       Tables  957.5775         5   
4           33311  South  Office Supplies      Storage   22.3680         2   
...           ...    ...              ...          ...       ...       ...   
9989        33180  South        Furniture  Furnishings   25.2480         3   
9990        92627   West        Furniture  Furnishings   91.9600         2   
9991        92627   West       Technology       Phones  258.5760         2   
9992        92627   West  Office Supplies        Paper   29.6000         4   
9993        92683   West  Office Supplies   Appliances  243.1600         2   

      Discount    Profit  
0         0.00   41.9136  
1         0.00  219.5820  
2         0.00    6.8714  
3         0.45 -383.0310  
4         0.20    2.5164  
...        ...       ...  
9989      0.20    4.1028  
9990      0.00   15.6332  
9991      0.20   19.3932  
9992      0.00   13.3200  
9993      0.00   72.9480  

[9994 rows x 13 columns]>
```

```
data.describe
```

```
<bound method NDFrame.describe of            Ship Mode    Segment        Country             City       State  \
0       Second Class   Consumer  United States        Henderson    Kentucky   
1       Second Class   Consumer  United States        Henderson    Kentucky   
2       Second Class  Corporate  United States      Los Angeles  California   
3     Standard Class   Consumer  United States  Fort Lauderdale     Florida   
4     Standard Class   Consumer  United States  Fort Lauderdale     Florida   
...              ...        ...            ...              ...         ...   
9989    Second Class   Consumer  United States            Miami     Florida   
9990  Standard Class   Consumer  United States       Costa Mesa  California   
9991  Standard Class   Consumer  United States       Costa Mesa  California   
9992  Standard Class   Consumer  United States       Costa Mesa  California   
9993    Second Class   Consumer  United States      Westminster  California   

      Postal Code Region         Category Sub-Category     Sales  Quantity  \
0           42420  South        Furniture    Bookcases  261.9600         2   
1           42420  South        Furniture       Chairs  731.9400         3   
2           90036   West  Office Supplies       Labels   14.6200         2   
3           33311  South        Furniture       Tables  957.5775         5   
4           33311  South  Office Supplies      Storage   22.3680         2   
...           ...    ...              ...          ...       ...       ...   
9989        33180  South        Furniture  Furnishings   25.2480         3   
9990        92627   West        Furniture  Furnishings   91.9600         2   
9991        92627   West       Technology       Phones  258.5760         2   
9992        92627   West  Office Supplies        Paper   29.6000         4   
```

```
9993        92683   West  Office Supplies   Appliances  243.1600         2

      Discount    Profit
0         0.00   41.9136
1         0.00  219.5820
2         0.00    6.8714
3         0.45 -383.0310
4         0.20    2.5164
...        ...       ...
9989      0.20    4.1028
9990      0.00   15.6332
9991      0.20   19.3932
9992      0.00   13.3200
9993      0.00   72.9480

[9994 rows x 13 columns]>
```

```
data.describe()
```

	Postal Code	Sales	Quantity	Discount	Profit
count	9994.000000	9994.000000	9994.000000	9994.000000	9994.000000
mean	55190.379428	229.858001	3.789574	0.156203	28.656896
std	32063.693350	623.245101	2.225110	0.206452	234.260108
min	1040.000000	0.444000	1.000000	0.000000	-6599.978000
25%	23223.000000	17.280000	2.000000	0.000000	1.728750
50%	56430.500000	54.490000	3.000000	0.200000	8.666500
75%	90008.000000	209.940000	5.000000	0.200000	29.364000
max	99301.000000	22638.480000	14.000000	0.800000	8399.976000

```
data.isna().any()
```

```
Ship Mode       False
Segment         False
Country         False
City            False
State           False
Postal Code     False
Region          False
Category        False
Sub-Category    False
Sales           False
Quantity        False
Discount        False
Profit          False
dtype: bool
```

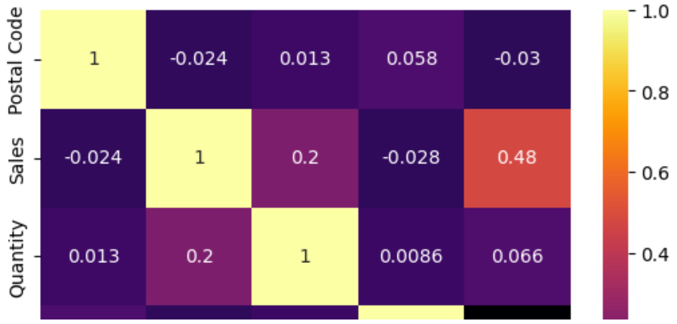
```
correlation=data.corr()
correlation
```

```
<ipython-input-15-d7a18ccdee06>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a f
  correlation=data.corr()
```

	Postal Code	Sales	Quantity	Discount	Profit
Postal Code	1.000000	-0.023854	0.012761	0.058443	-0.029961
Sales	-0.023854	1.000000	0.200795	-0.028190	0.479064
Quantity	0.012761	0.200795	1.000000	0.008623	0.066253
Discount	0.058443	-0.028190	0.008623	1.000000	-0.219487
Profit	-0.029961	0.479064	0.066253	-0.219487	1.000000

```
import seaborn as sns
sns.heatmap(data.corr(),annot=True,cmap='inferno')
```

```
<ipython-input-16-bdc76ecc106c>:2: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a f
  sns.heatmap(data.corr(),annot=True,cmap='inferno')
<Axes: >
```



```
data['City'].value_counts()
```

```
New York City        915
Los Angeles          747
Philadelphia         537
San Francisco        510
Seattle              428
                    ...
Glenview               1
Missouri City          1
Rochester Hills        1
Palatine               1
Manhattan              1
Name: City, Length: 531, dtype: int64
```

```
print(data["City"].unique())
```

```
['Henderson' 'Los Angeles' 'Fort Lauderdale' 'Concord' 'Seattle'
 'Fort Worth' 'Madison' 'West Jordan' 'San Francisco' 'Fremont'
 'Philadelphia' 'Orem' 'Houston' 'Richardson' 'Naperville' 'Melbourne'
 'Eagan' 'Westland' 'Dover' 'New Albany' 'New York City' 'Troy' 'Chicago'
 'Gilbert' 'Springfield' 'Jackson' 'Memphis' 'Decatur' 'Durham' 'Columbia'
 'Rochester' 'Minneapolis' 'Portland' 'Saint Paul' 'Aurora' 'Charlotte'
 'Orland Park' 'Urbandale' 'Columbus' 'Bristol' 'Wilmington' 'Bloomington'
 'Phoenix' 'Roseville' 'Independence' 'Pasadena' 'Newark' 'Franklin'
 'Scottsdale' 'San Jose' 'Edmond' 'Carlsbad' 'San Antonio' 'Monroe'
 'Fairfield' 'Grand Prairie' 'Redlands' 'Hamilton' 'Westfield' 'Akron'
 'Denver' 'Dallas' 'Whittier' 'Saginaw' 'Medina' 'Dublin' 'Detroit'
 'Tampa' 'Santa Clara' 'Lakeville' 'San Diego' 'Brentwood' 'Chapel Hill'
 'Morristown' 'Cincinnati' 'Inglewood' 'Tamarac' 'Colorado Springs'
 'Belleville' 'Taylor' 'Lakewood' 'Arlington' 'Arvada' 'Hackensack'
 'Saint Petersburg' 'Long Beach' 'Hesperia' 'Murfreesboro' 'Layton'
 'Austin' 'Lowell' 'Manchester' 'Harlingen' 'Tucson' 'Quincy'
 'Pembroke Pines' 'Des Moines' 'Peoria' 'Las Vegas' 'Warwick' 'Miami'
 'Huntington Beach' 'Richmond' 'Louisville' 'Lawrence' 'Canton'
 'New Rochelle' 'Gastonia' 'Jacksonville' 'Auburn' 'Norman' 'Park Ridge'
 'Amarillo' 'Lindenhurst' 'Huntsville' 'Fayetteville' 'Costa Mesa'
 'Parker' 'Atlanta' 'Gladstone' 'Great Falls' 'Lakeland' 'Montgomery'
 'Mesa' 'Green Bay' 'Anaheim' 'Marysville' 'Salem' 'Laredo' 'Grove City'
 'Dearborn' 'Warner Robins' 'Vallejo' 'Mission Viejo' 'Rochester Hills'
 'Plainfield' 'Sierra Vista' 'Vancouver' 'Cleveland' 'Tyler' 'Burlington'
 'Waynesboro' 'Chester' 'Cary' 'Palm Coast' 'Mount Vernon' 'Hialeah'
 'Oceanside' 'Evanston' 'Trenton' 'Cottage Grove' 'Bossier City'
 'Lancaster' 'Asheville' 'Lake Elsinore' 'Omaha' 'Edmonds' 'Santa Ana'
 'Milwaukee' 'Florence' 'Lorain' 'Linden' 'Salinas' 'New Brunswick'
 'Garland' 'Norwich' 'Alexandria' 'Toledo' 'Farmington' 'Riverside'
 'Torrance' 'Round Rock' 'Boca Raton' 'Virginia Beach' 'Murrieta'
 'Olympia' 'Washington' 'Jefferson City' 'Saint Peters' 'Rockford'
 'Brownsville' 'Yonkers' 'Oakland' 'Clinton' 'Encinitas' 'Roswell'
 'Jonesboro' 'Antioch' 'Homestead' 'La Porte' 'Lansing' 'Cuyahoga Falls'
 'Reno' 'Harrisonburg' 'Escondido' 'Royal Oak' 'Rockville' 'Coral Springs'
 'Buffalo' 'Boynton Beach' 'Gulfport' 'Fresno' 'Greenville' 'Macon'
 'Cedar Rapids' 'Providence' 'Pueblo' 'Deltona' 'Murray' 'Middletown'
 'Freeport' 'Pico Rivera' 'Provo' 'Pleasant Grove' 'Smyrna' 'Parma'
 'Mobile' 'New Bedford' 'Irving' 'Vineland' 'Glendale' 'Niagara Falls'
 'Thomasville' 'Westminster' 'Coppell' 'Pomona' 'North Las Vegas'
 'Allentown' 'Tempe' 'Laguna Niguel' 'Bridgeton' 'Everett' 'Watertown'
 'Appleton' 'Bellevue' 'Allen' 'El Paso' 'Grapevine' 'Carrollton' 'Kent'
 'Lafayette' 'Tigard' 'Skokie' 'Plano' 'Suffolk' 'Indianapolis' 'Bayonne'
 'Greensboro' 'Baltimore' 'Kenosha' 'Olathe' 'Tulsa' 'Redmond' 'Raleigh'
 'Muskogee' 'Meriden' 'Bowling Green' 'South Bend' 'Spokane' 'Keller'
 'Port Orange' 'Medford' 'Charlottesville' 'Missoula' 'Apopka' 'Reading'
 'Broomfield' 'Paterson' 'Oklahoma City' 'Chesapeake' 'Lubbock'
 'Johnson City' 'San Bernardino' 'Leominster' 'Bozeman' 'Perth Amboy'
 'Ontario' 'Rancho Cucamonga' 'Moorhead' 'Mesquite' 'Stockton'
 'Ormond Beach' 'Sunnyvale' 'York' 'College Station' 'Saint Louis'
 'Manteca' 'San Angelo' 'Salt Lake City' 'Knoxville' 'Little Rock'
 'Lincoln Park' 'Marion' 'Littleton' 'Bangor' 'Southaven' 'New Castle'
 'Midland' 'Sioux Falls' 'Fort Collins' 'Clarksville' 'Sacramento'
 'Thousand Oaks' 'Malden' 'Holyoke' 'Albuquerque' 'Sparks' 'Coachella'
 'Elmhurst' 'Passaic' 'North Charleston' 'Newport News' 'Jamestown'
 'Mishawaka' 'La Quinta' 'Tallahassee' 'Nashville' 'Bellingham'
 'Woodstock' 'Haltom City' 'Wheeling' 'Summerville' 'Hot Springs'
 'Englewood' 'Las Cruces' 'Hoover' 'Frisco' 'Vacaville' 'Waukesha'
 'Bakersfield' 'Pompano Beach' 'Corpus Christi' 'Redondo Beach' 'Orlando'
```

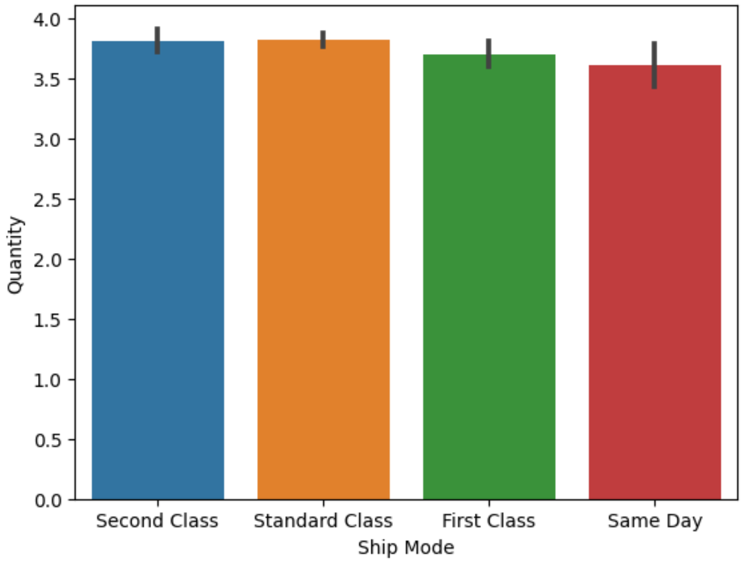
```
data['Profit'].value_counts()
```

```
0.0000     65
6.2208     43
9.3312     38
5.4432     32
3.6288     32
           ..
83.2508     1
16.1096     1
7.1988      1
1.6510      1
72.9480     1
Name: Profit, Length: 7287, dtype: int64
```

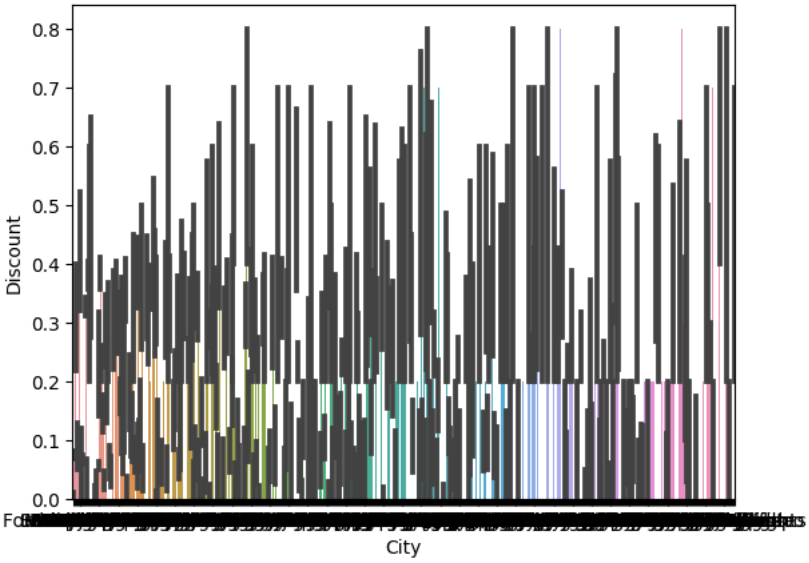
```
data['Ship Mode'].value_counts()
```

```
Standard Class    5968
Second Class      1945
First Class       1538
Same Day           543
Name: Ship Mode, dtype: int64
```

```
sns.barplot(x = 'Ship Mode',y = 'Quantity',data = data)
plt.show()
```

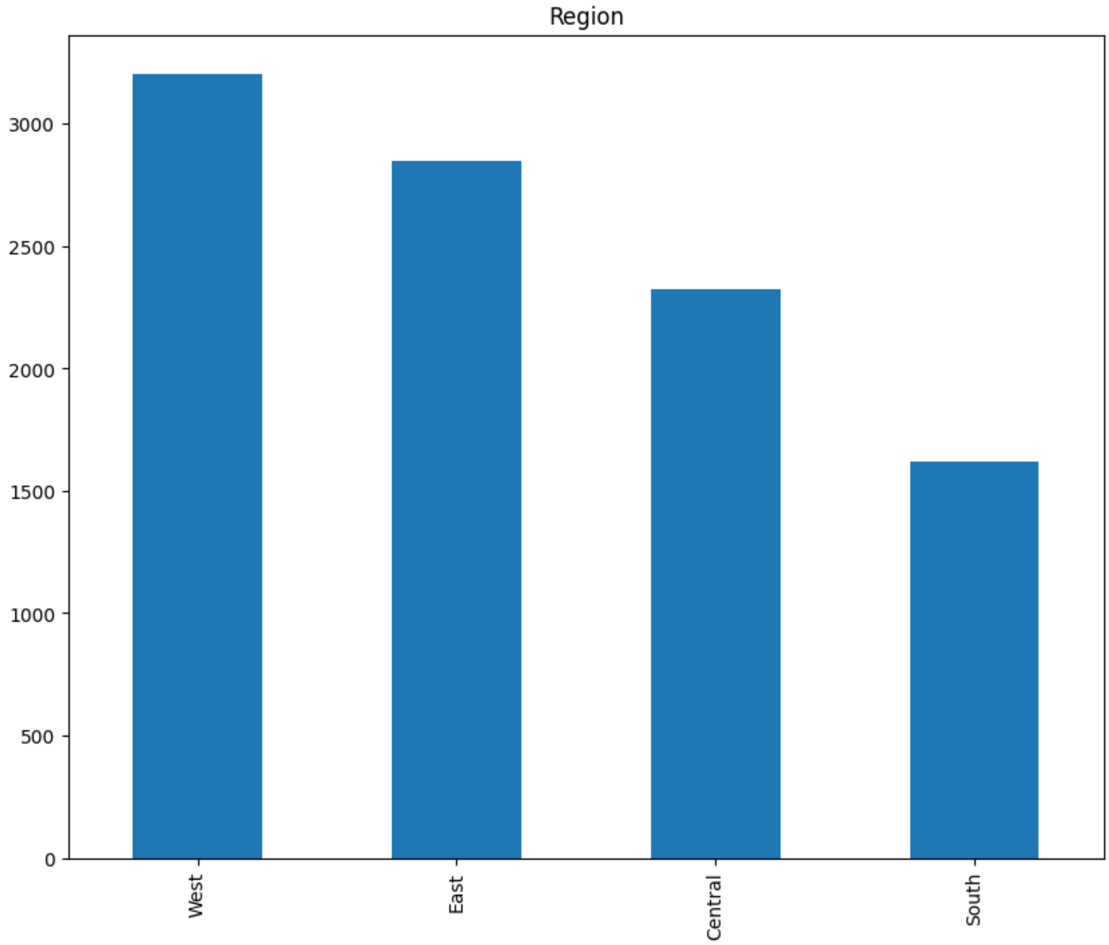


```
sns.barplot(x = 'City',y = 'Discount',data = data)
plt.show()
```



```
t1 = data['Region'].value_counts()[:150]
t1.plot(kind='bar',figsize=(10,8))
plt.title('Region')
```

```
Text(0.5, 1.0, 'Region')
```



```
print(data["Country"].unique())
```

```
['United States']
```

```
print(data["Segment"].unique())
```

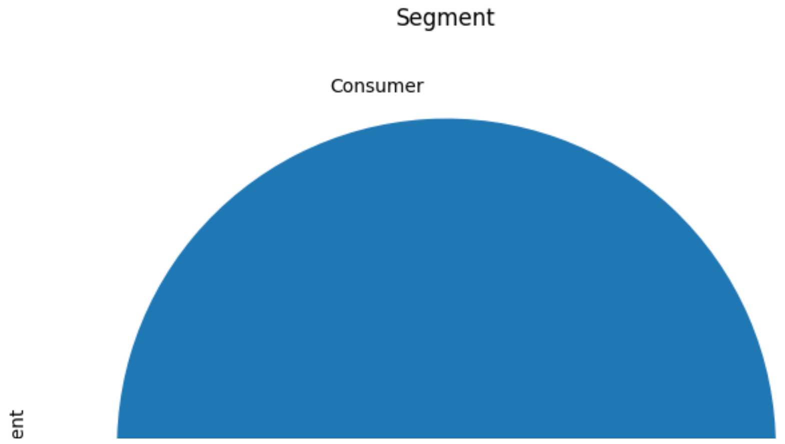
```
['Consumer' 'Corporate' 'Home Office']
```

```
data['Segment'].value_counts()
```

```
Consumer       5191
Corporate      3020
Home Office    1783
Name: Segment, dtype: int64
```

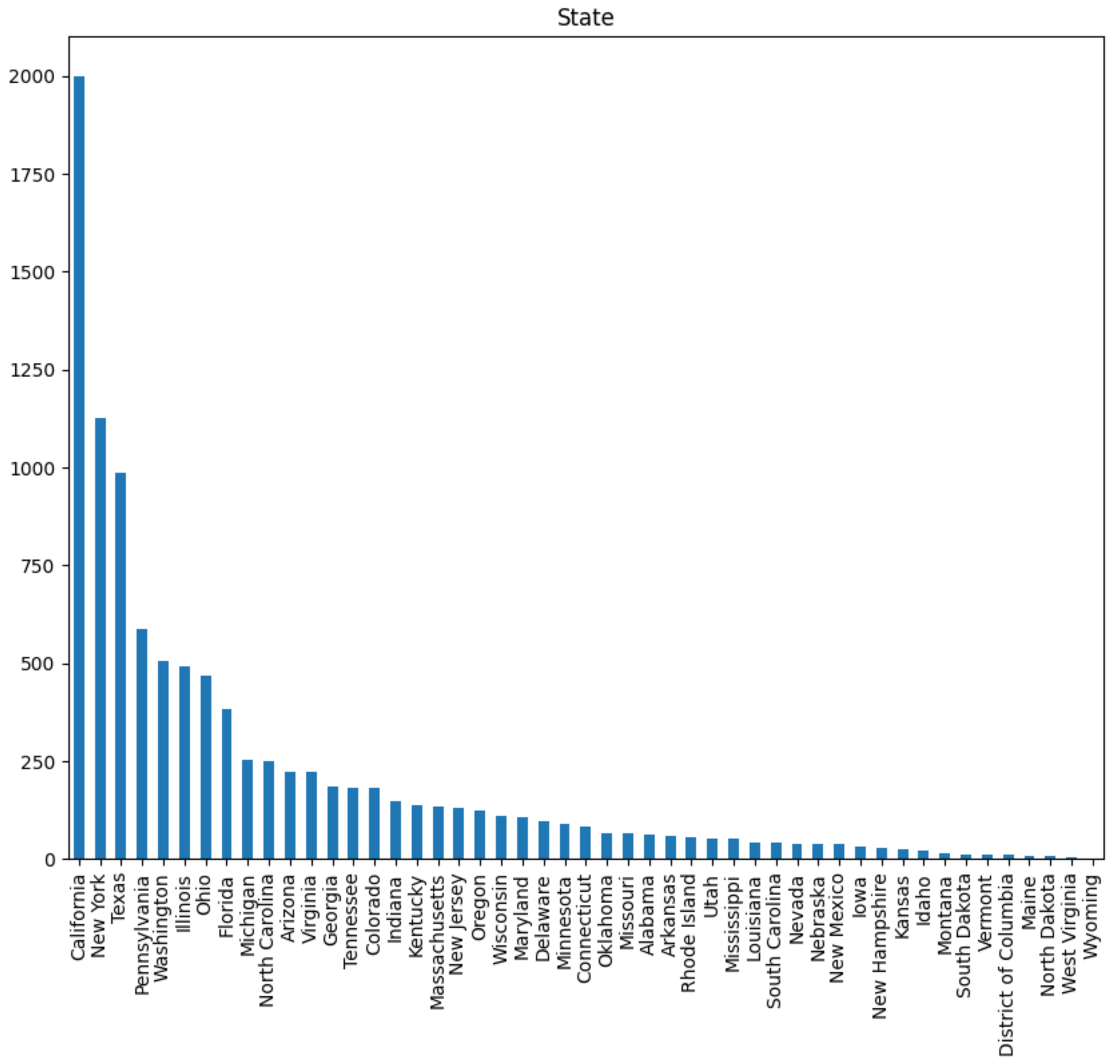
```
s1 = data['Segment'].value_counts()[:150]
s1.plot(kind='pie',figsize=(10,8))
plt.title('Segment')
```

```
Text(0.5, 1.0, 'Segment')
```



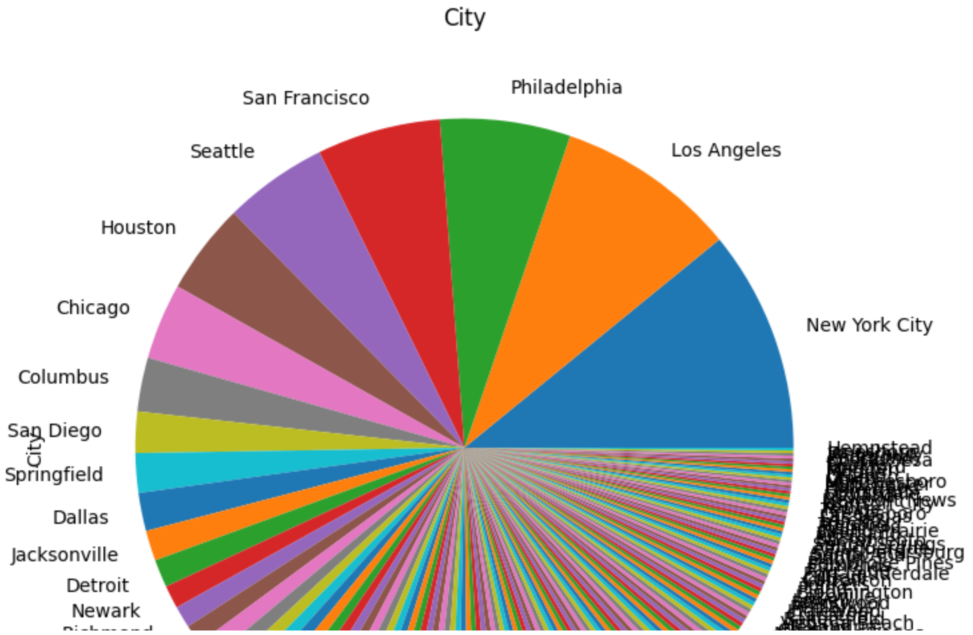
```
R1 = data['State'].value_counts()[:150]
R1.plot(kind='bar',figsize=(10,8))
plt.title('State')
```

```
Text(0.5, 1.0, 'State')
```



```
c1 = data['City'].value_counts()[:150]
c1.plot(kind='pie',figsize=(10,8))
plt.title('City')
```

```
Text(0.5, 1.0, 'City')
```



```
data['Sub-Category'].value_counts()
```

```
Binders        1523
Paper          1370
Furnishings     957
Phones          889
Storage         846
Art             796
Accessories     775
Chairs          617
Appliances      466
Labels          364
Tables          319
Envelopes       254
Bookcases       228
Fasteners       217
Supplies        190
Machines        115
Copiers          68
Name: Sub-Category, dtype: int64
```

```
data['Sub-Category'].value_counts().sum()
```

```
9994
```

```
data.cov()
```

```
<ipython-input-32-72e63cb34c7c>:1: FutureWarning: The default value of numeric_only in DataFrame.cov is deprecated. In a fu
  data.cov()
```

	Postal Code	Sales	Quantity	Discount	Profit
Postal Code	1.028080e+09	-476682.766590	910.415885	386.870404	-225045.849445
Sales	-4.766828e+05	388434.455308	278.459923	-3.627228	69944.096586
Quantity	9.104159e+02	278.459923	4.951113	0.003961	34.534769
Discount	3.868704e+02	-3.627228	0.003961	0.042622	-10.615173
Profit	-2.250458e+05	69944.096586	34.534769	-10.615173	54877.798055

```
data['Sub-Category'].value_counts().mean()
```

```
587.8823529411765
```

```
data['Segment'].value_counts().mean()
```

```
3331.3333333333335
```