Exploratory Data Analysis - Retail

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Perform ‘Exploratory Data Analysis’ on dataset ‘SampleSuperstore’ , find out the weak areas where you can work to make more profit.

Dataset : https://bit.ly/3i4rbWl (https://bit.ly/3i4rbWl)

Importing all the libraries that required for this project.

In [2]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

Understanding the Data

In [5]:
```
df = pd.read_csv(r'C:\Users\HP\Desktop\SampleSuperstore.csv')
df.head()
```

Out[5]:

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Sub-Category	Sa
0	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Bookcases	261.96
1	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Chairs	731.94
2	Second Class	Corporate	United States	Los Angeles	California	90036	West	Office Supplies	Labels	14.62
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Furniture	Tables	957.57
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Office Supplies	Storage	22.36

In [6]:
```
df.tail()
```

Out[6]:

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Sub-Category
9989	Second Class	Consumer	United States	Miami	Florida	33180	South	Furniture	Furnishings
9990	Standard Class	Consumer	United States	Costa Mesa	California	92627	West	Furniture	Furnishings
9991	Standard Class	Consumer	United States	Costa Mesa	California	92627	West	Technology	Phones
9992	Standard Class	Consumer	United States	Costa Mesa	California	92627	West	Office Supplies	Paper
9993	Second Class	Consumer	United States	Westminster	California	92683	West	Office Supplies	Appliances

In [7]:
```
df.shape
```

Out[7]:
```
(9994, 13)
```

In [8]:
```
df.describe()
```

Out[8]:

	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

In [9]:
```
df.columns
```

Out[9]:
```
Index(['Ship Mode', 'Segment', 'Country', 'City', 'State', 'Postal Code',
       'Region', 'Category', 'Sub-Category', 'Sales', 'Quantity', 'Discount',
       'Profit'],
      dtype='object')
```

In [10]:
```
df.nunique()
```

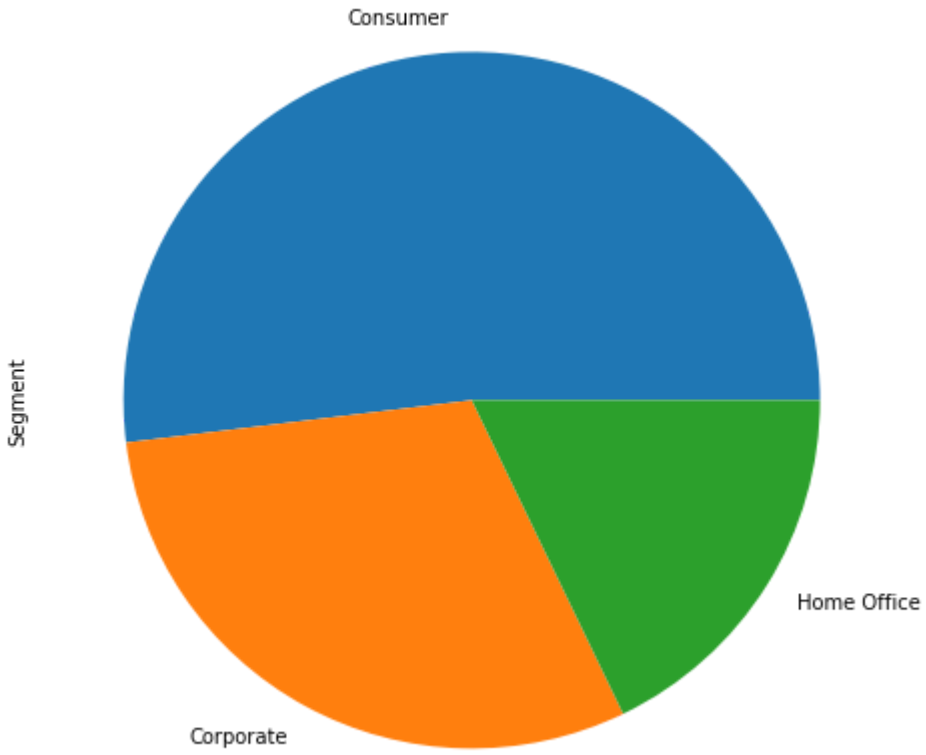
Out[10]:
```
Ship Mode          4
Segment            3
Country            1
City             531
State             49
Postal Code      631
Region             4
Category           3
Sub-Category      17
Sales           5825
Quantity          14
Discount          12
Profit          7287
dtype: int64
```

In [11]:
```
df['Segment'].unique()
```

Out[11]:
```
array(['Consumer', 'Corporate', 'Home Office'], dtype=object)
```

In [71]:
```
plt.figure(figsize=(14,8))
df['Segment'].value_counts().plot.pie()
```

Out[71]:
```
<AxesSubplot:ylabel='Segment'>
```

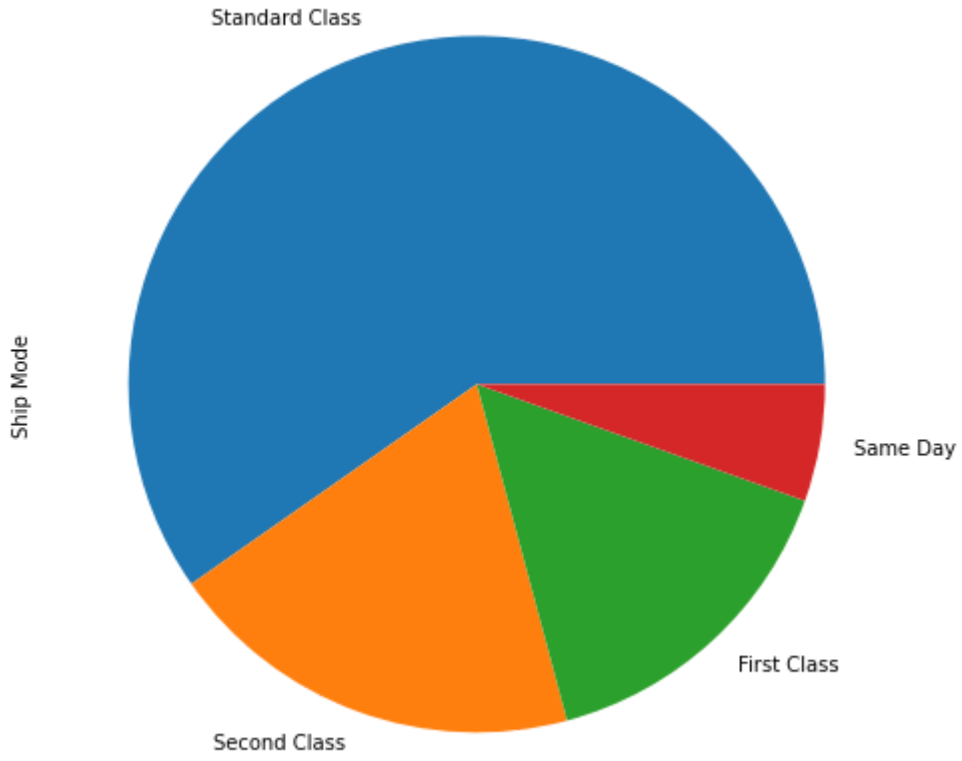


In [12]:
```
df['Ship Mode'].unique()
```

Out[12]:
```
array(['Second Class', 'Standard Class', 'First Class', 'Same Day'],
      dtype=object)
```

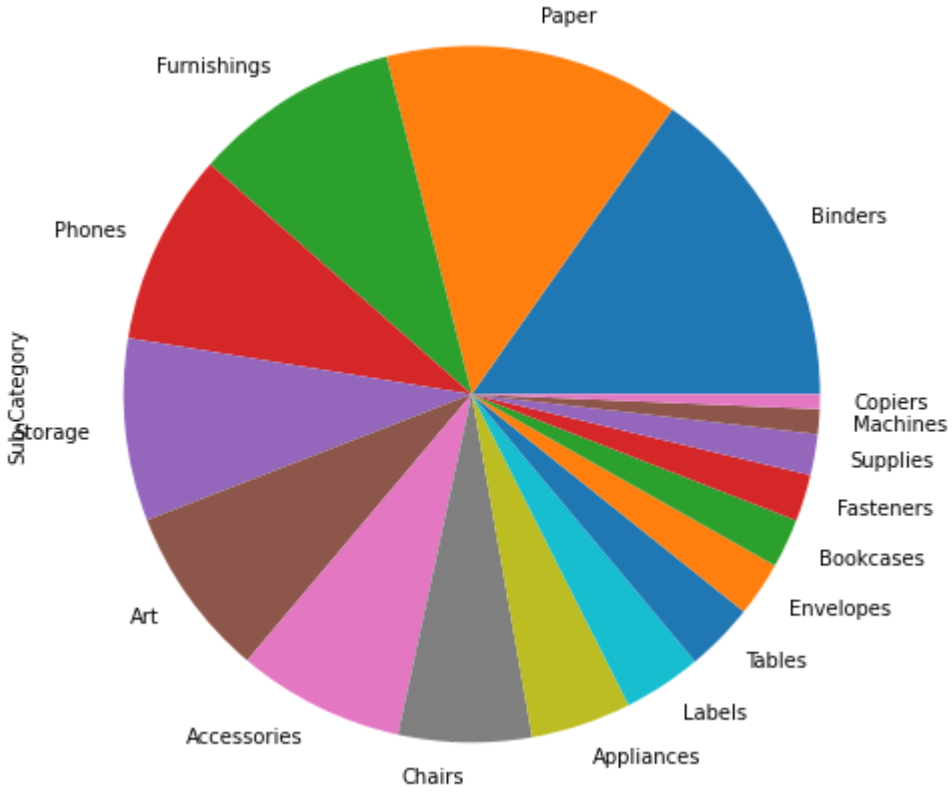
In [72]:
```
plt.figure(figsize=(14,8))
df['Ship Mode'].value_counts().plot.pie()
```

Out[72]:
```
<AxesSubplot:ylabel='Ship Mode'>
```



In [70]:
```
plt.figure(figsize=(14,8))
df['Sub-Category'].value_counts().plot.pie()
```

Out[70]: <AxesSubplot:ylabel='Sub-Category'>



Cleaning the data

In [13]:
```
df.isnull().sum()
```

Out[13]:
```
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
```

In [62]:
```
Store = df.drop(['Postal Code'],axis=1)
Store.head(10)
```

Out[62]:

	Ship Mode	Segment	Country	City	State	Region	Category	Sub-Category	Sales	Q
0	Second Class	Consumer	United States	Henderson	Kentucky	South	Furniture	Bookcases	261.9600	
1	Second Class	Consumer	United States	Henderson	Kentucky	South	Furniture	Chairs	731.9400	
2	Second Class	Corporate	United States	Los Angeles	California	West	Office Supplies	Labels	14.6200	
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	South	Furniture	Tables	957.5775	
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	South	Office Supplies	Storage	22.3680	
5	Standard Class	Consumer	United States	Los Angeles	California	West	Furniture	Furnishings	48.8600	
6	Standard Class	Consumer	United States	Los Angeles	California	West	Office Supplies	Art	7.2800	
7	Standard Class	Consumer	United States	Los Angeles	California	West	Technology	Phones	907.1520	
8	Standard Class	Consumer	United States	Los Angeles	California	West	Office Supplies	Binders	18.5040	
9	Standard Class	Consumer	United States	Los Angeles	California	West	Office Supplies	Appliances	114.9000	

EDA

Relationship Analysis

In [63]:
```
corr = Store.corr()
```

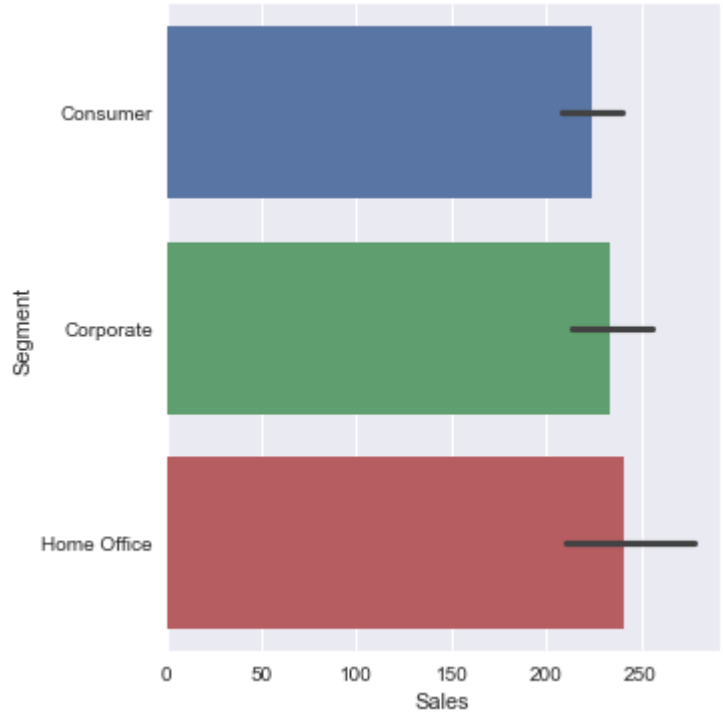
In [64]:
```
sns.heatmap(corr,xticklabels=corr.columns,yticklabels=corr.columns,annot=True)
```

Out[64]: <AxesSubplot:>

catplot for Sales VS Segment and Sales VS Ship Mode

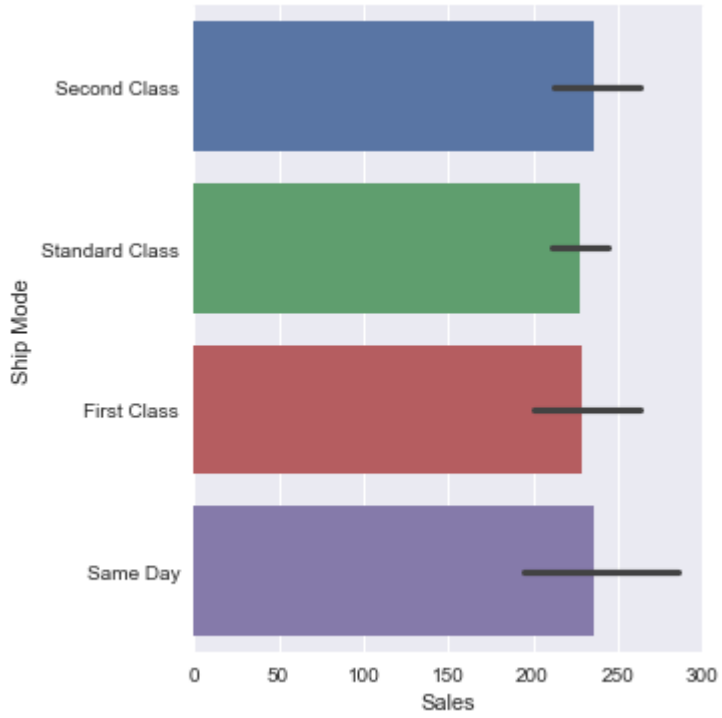
In [84]:
```
sns.catplot(x='Sales',y='Segment',data=df,kind='bar')
```

Out[84]: <seaborn.axisgrid.FacetGrid at 0x2205eaef208>

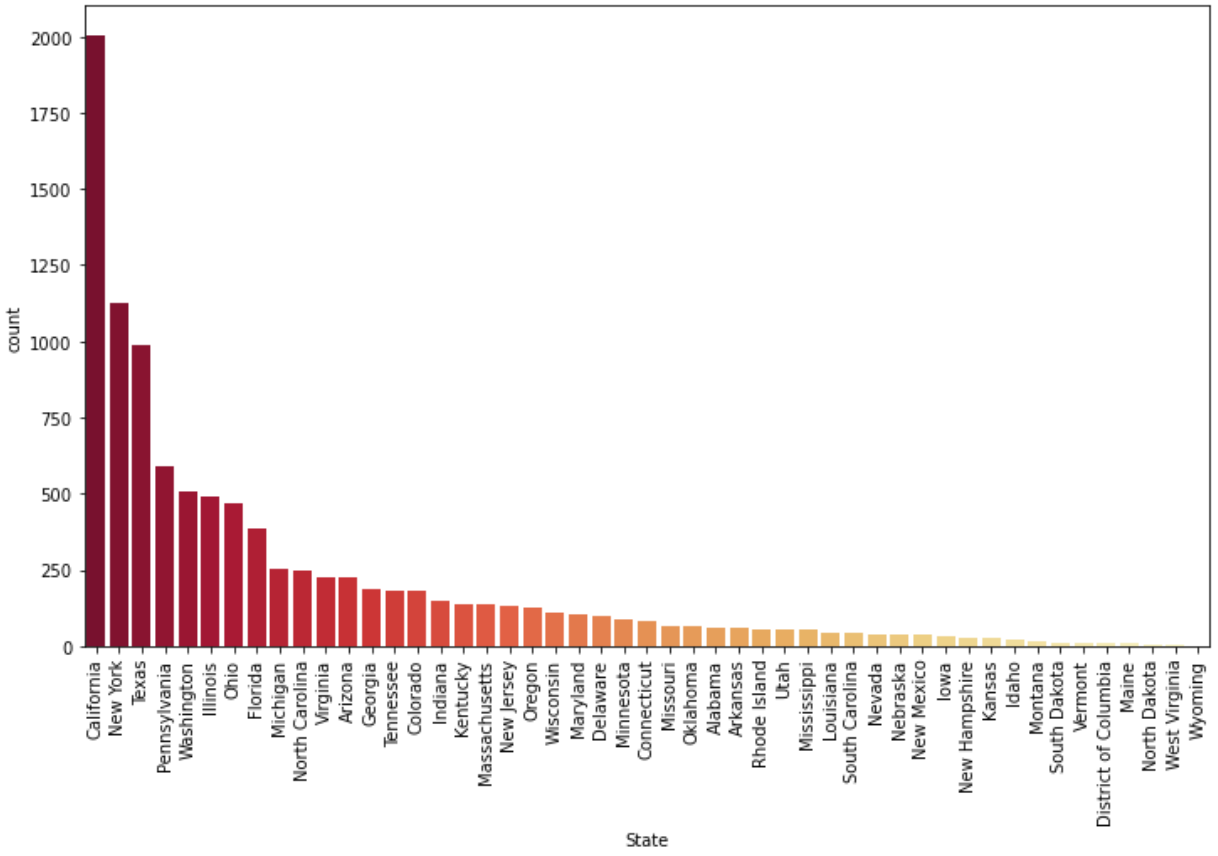


In [85]:
```
sns.catplot(x='Sales',y='Ship Mode',data=df,kind='bar')
```

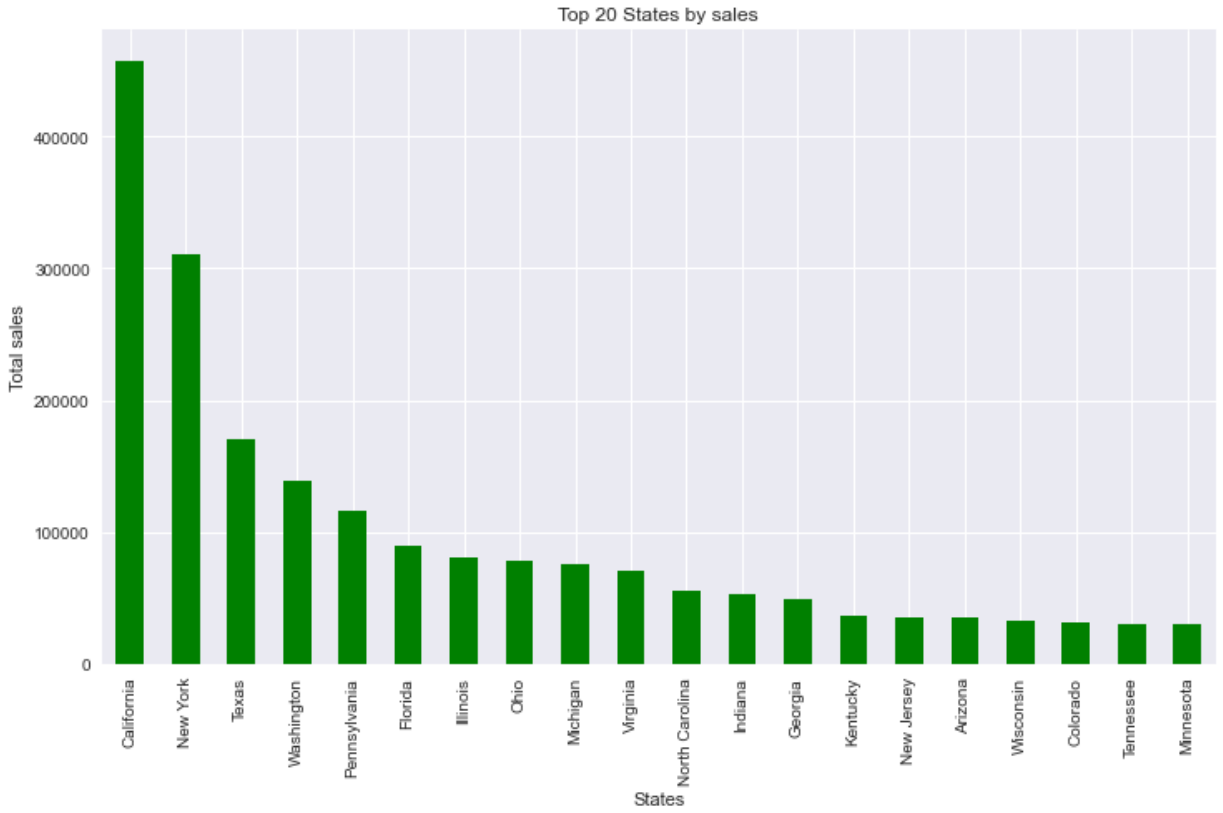
Out[85]:
```
<seaborn.axisgrid.FacetGrid at 0x2205e8be908>
```



In [76]:
```
plt.figure(figsize=(12,7))
sns.countplot(x='State',data=df,palette='YlOrRd_r',order=df['State'].value_counts
plt.xticks(rotation=90)
plt.show()
```



In [82]:
```
plt.style.use('seaborn')
df.groupby('State').Sales.sum().nlargest(n=20).plot(kind='bar',figsize=(12,7),col
plt.xlabel('States')
plt.ylabel('Total sales')
plt.title('Top 20 States by sales')
plt.show()
```



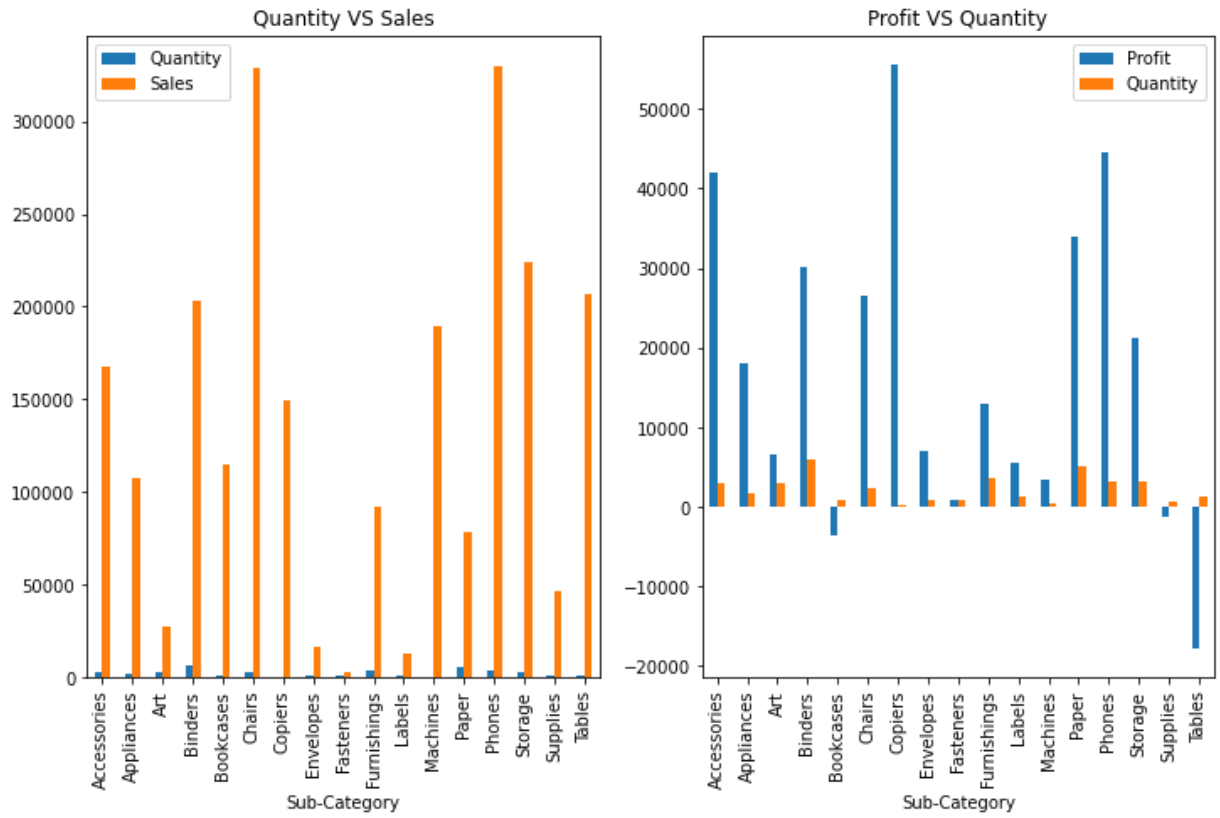
California has Highest Sales

comapring Sales VS Quantity VS Profit

In [65]:
```
fig,axes=plt.subplots(1,2,figsize=(12,7))
df.groupby('Sub-Category')['Quantity','Sales'].agg(sum).plot(kind='bar',ax=axes[0

df.groupby('Sub-Category')['Profit','Quantity'].agg(sum).plot(kind='bar',ax=axes[
```

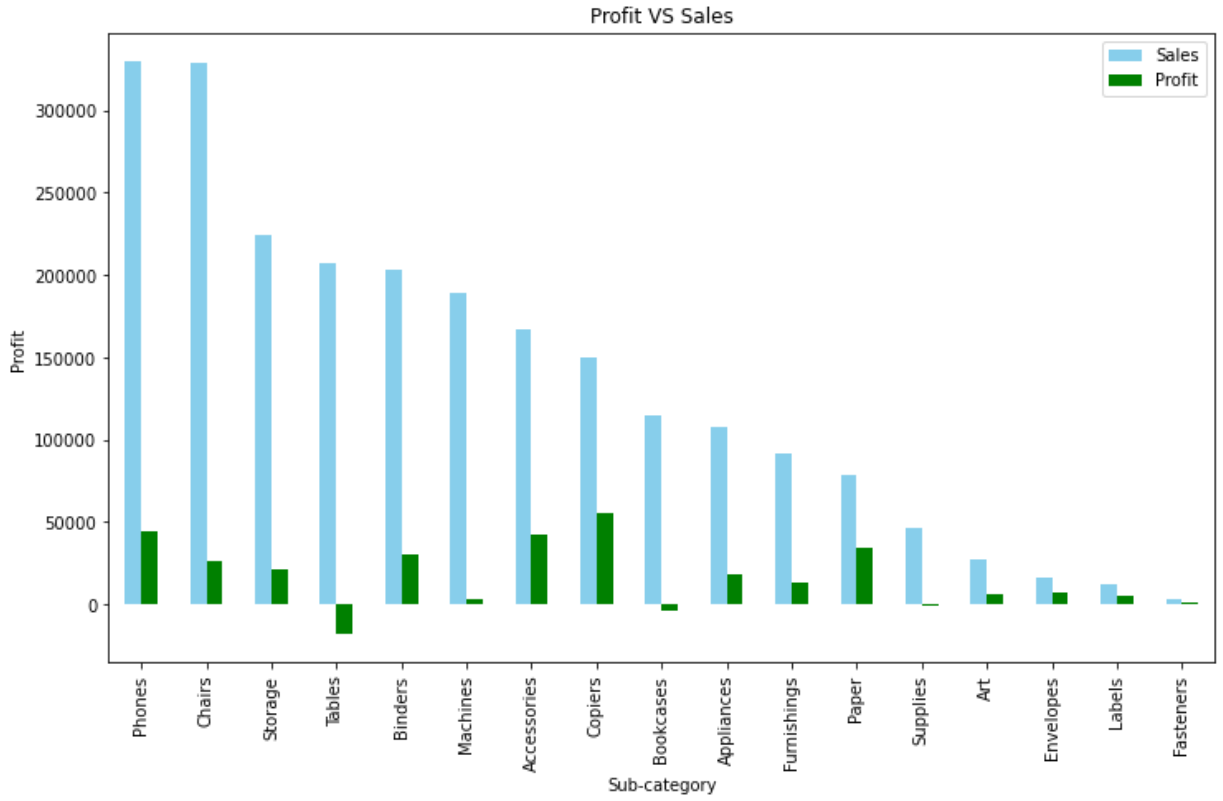
```
C:\Users\HP\anaconda3\lib\site-packages\ipykernel_launcher.py:2: FutureWarning:
Indexing with multiple keys (implicitly converted to a tuple of keys) will be d
eprecated, use a list instead.

C:\Users\HP\anaconda3\lib\site-packages\ipykernel_launcher.py:4: FutureWarning:
Indexing with multiple keys (implicitly converted to a tuple of keys) will be d
eprecated, use a list instead.
  after removing the cwd from sys.path.
```

Out[65]: <AxesSubplot:title={'center':'Profit VS Quantity'}, xlabel='Sub-Category'>



In [66]:
```
Profit_sales=df.groupby('Sub-Category')['Sales','Profit'].sum().sort_values(by='S
Profit_sales.plot.bar(color=['skyblue','green'],figsize=(12,7))
plt.title('Profit VS Sales')
plt.xlabel('Sub-category')
plt.ylabel('Profit')
plt.show()
```

```
C:\Users\HP\anaconda3\lib\site-packages\ipykernel_launcher.py:1: FutureWarning:
Indexing with multiple keys (implicitly converted to a tuple of keys) will be d
eprecated, use a list instead.
  """Entry point for launching an IPython kernel.
```



Copiers have Highest Profit even though Phones and chairs has highest sales in the market.

```
Conclusion:
Home office has highest sales compared to other Segments.
Same day has highest sales compared to other Ship Mode.
California State is at Top of in both Sales and Profit.
Copiers have highest profit even though phones and chairs both have highest
sales in the
Chairs have high sales but least profit compared to phones.
Tables have least profit.
```

In [ ]:
```
0
```