superstore-data-analysis

March 24, 2024

1 Importing Necessary Libraries

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
```

2 Problem Statement

Identifying Key metrices from the dataset and providing insights to further increase revenue via sales

2.1 Now Performing EDA

[2]:
```
# Loading the dataset
df = pd.read_excel(r'C:\Users\ntpc\Desktop\Global Superstore Orders 2016.xlsx')
df.head()
```

[2]:

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	\
0	40098	CA-2014-AB10015140-41954	2014-11-11	2014-11-13	First Class	
1	26341	IN-2014-JR162107-41675	2014-02-05	2014-02-07	Second Class	
2	25330	IN-2014-CR127307-41929	2014-10-17	2014-10-18	First Class	
3	13524	ES-2014-KM1637548-41667	2014-01-28	2014-01-30	First Class	
4	47221	SG-2014-RH9495111-41948	2014-11-05	2014-11-06	Same Day	

	Customer ID	Customer Name	Segment	Postal Code	City	\
0	AB-100151402	Aaron Bergman	Consumer	73120.0	Oklahoma City	
1	JR-162107	Justin Ritter	Corporate	NaN	Wollongong	
2	CR-127307	Craig Reiter	Consumer	NaN	Brisbane	
3	KM-1637548	Katherine Murray	Home Office	NaN	Berlin	
4	RH-9495111	Rick Hansen	Consumer	NaN	Dakar	

	…	Product ID	Category	Sub-Category	\
0	…	TEC-PH-5816	Technology	Phones	
1	…	FUR-CH-5379	Furniture	Chairs	
2	…	TEC-PH-5356	Technology	Phones	
3	…	TEC-PH-5267	Technology	Phones	

```
4  …  TEC-CO-6011  Technology      Copiers

                                Product Name     Sales Quantity Discount  \
0                           Samsung Convoy 3   221.980        2      0.0
1  Novimex Executive Leather Armchair, Black  3709.395        9      0.1
2          Nokia Smart Phone, with Caller ID  5175.171        9      0.1
3             Motorola Smart Phone, Cordless  2892.510        5      0.1
4             Sharp Wireless Fax, High-Speed  2832.960        8      0.0

     Profit  Shipping Cost  Order Priority
0   62.1544          40.77            High
1 -288.7650         923.63        Critical
2  919.9710         915.49          Medium
3  -96.5400         910.16          Medium
4  311.5200         903.04        Critical

[5 rows x 24 columns]
```

[3]:
```
# Checking the  shape  of dataset
df.shape
```

[3]:
```
(51290, 24)
```

[4]:
```
# Checking if the dataset contains any null values
df.isnull().sum()
```

[4]:
```
Row ID              0
Order ID            0
Order Date          0
Ship Date           0
Ship Mode           0
Customer ID         0
Customer Name       0
Segment             0
Postal Code       41296
City                0
State               0
Country             0
Region              0
Market              0
Product ID          0
Category            0
Sub-Category        0
Product Name        0
Sales               0
Quantity            0
Discount            0
```

```
Profit                0
Shipping Cost         0
Order Priority        0
dtype: int64
```

[6]:
```
#Now dropping the Postal Code Column since it is not necessary for our analysis
df.drop(columns='Postal Code',inplace=True)
```

[7]:
```
# Now Checking if the dataset contains any null values
df.isnull().sum()
```

[7]:
```
Row ID            0
Order ID          0
Order Date        0
Ship Date         0
Ship Mode         0
Customer ID       0
Customer Name     0
Segment           0
City              0
State             0
Country           0
Region            0
Market            0
Product ID        0
Category          0
Sub-Category      0
Product Name      0
Sales             0
Quantity          0
Discount          0
Profit            0
Shipping Cost     0
Order Priority    0
dtype: int64
```

2.2 Shipping Mode

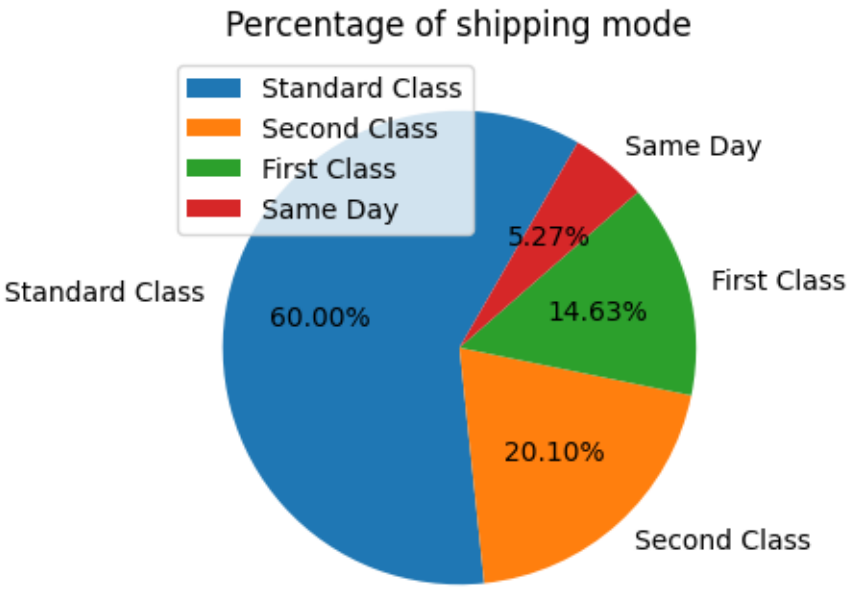
[8]:
```
df['Ship Mode'].value_counts()
```

[8]:
```
Ship Mode
Standard Class    30775
Second Class      10309
First Class        7505
Same Day           2701
Name: count, dtype: int64
```

[9]:
```
x= df['Ship Mode'].value_counts().index
```

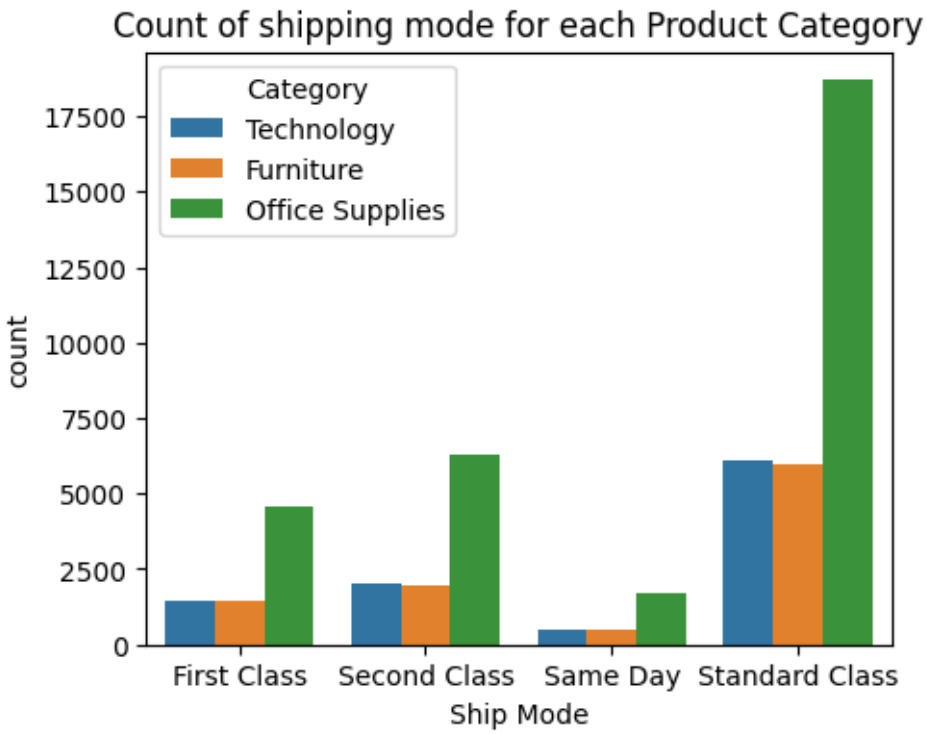
[10]:
```
y=df['Ship Mode'].value_counts().values
```

[11]:
```
# Checking the Percentage of each shipping Mode
plt.figure(figsize=(5,4))
plt.pie(y,labels=x,startangle=60,autopct="%0.2f%%")
plt.legend(loc=2)
plt.title("Percentage of shipping mode")
plt.savefig("Percentage of shipping mode.jpg")
plt.show()
```



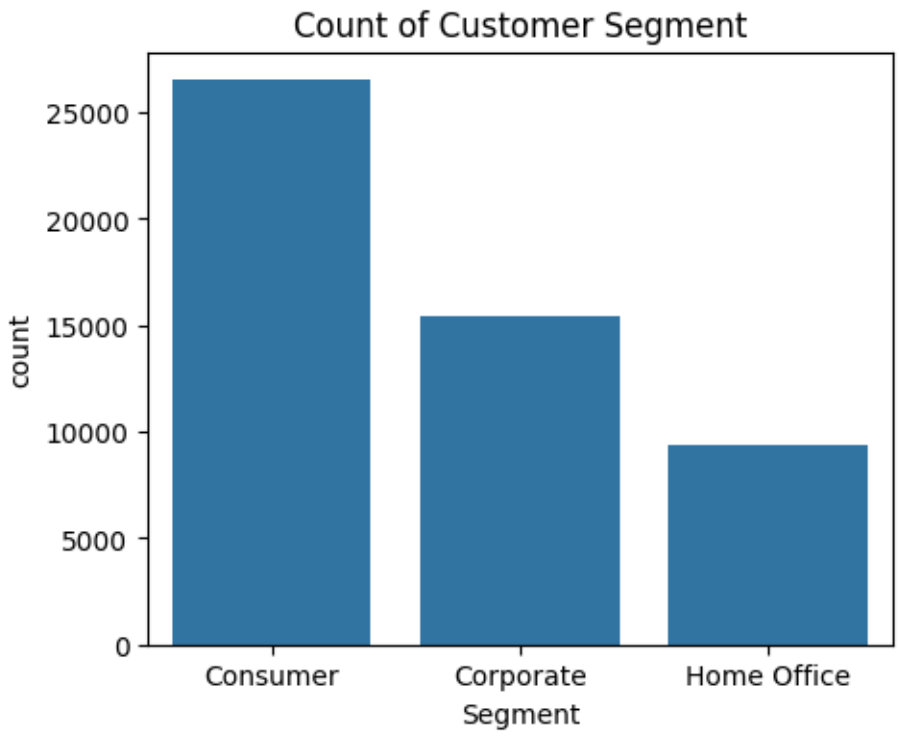
2.3 Count of shipping mode for each Product Category

[12]:
```
plt.figure(figsize=(5,4))
sns.countplot(x='Ship Mode',data=df,hue='Category')
plt.title("Count of shipping mode for each Product Category")
plt.savefig("Count of shipping mode for each Product Category.jpg")
plt.show()
```



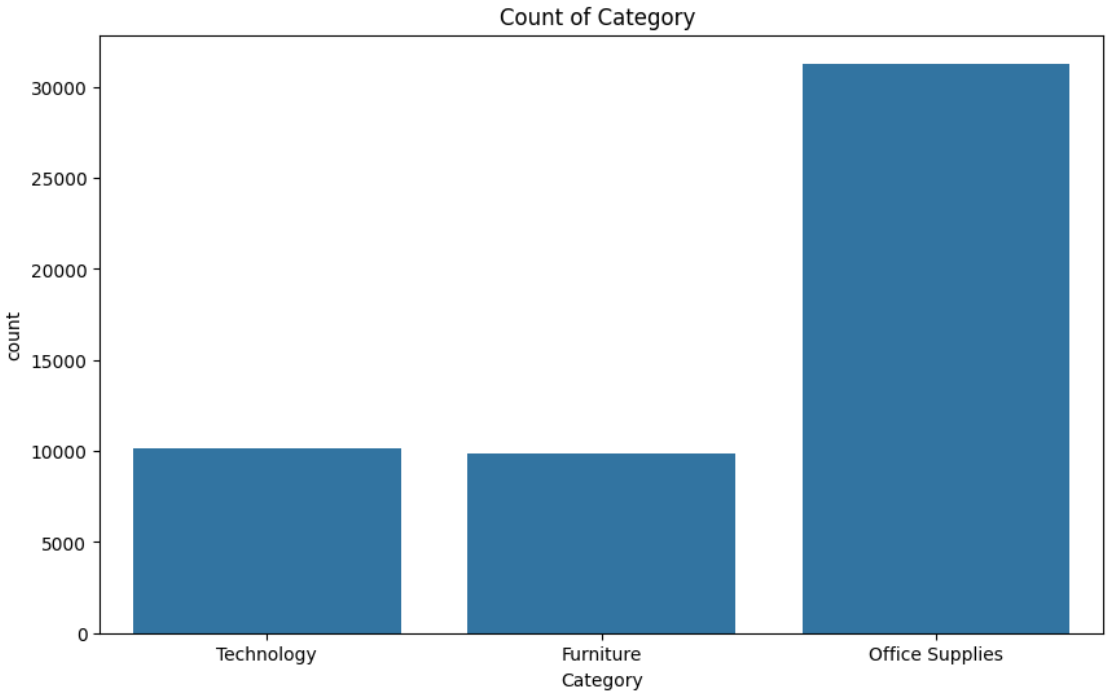
2.4 Customer Segment

[13]:
```
plt.figure(figsize=(5,4))
sns.countplot(x='Segment',data=df)
plt.title("Count of Customer Segment")
plt.savefig("Count of Customer Segment.jpg")
plt.show()
```



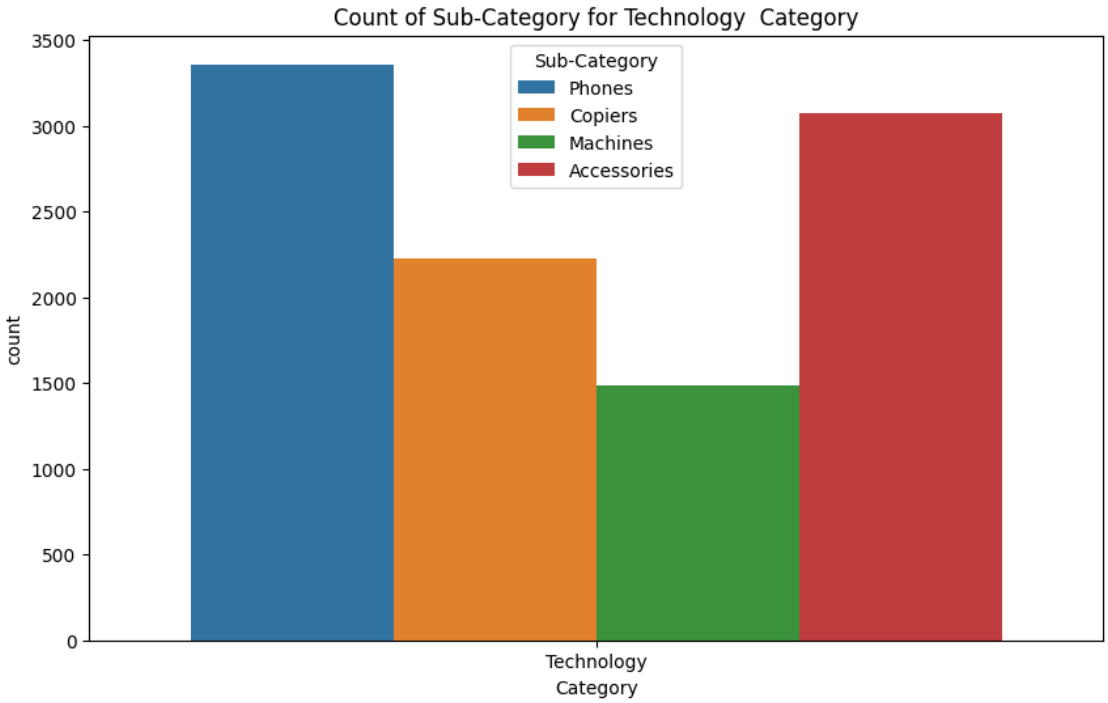
2.5 Count of Product Category

[14]:
```
plt.figure(figsize=(10,6))
sns.countplot(x='Category',data=df)
plt.title("Count of Category ")
plt.savefig("Count of  Category.jpg")
plt.show()
```



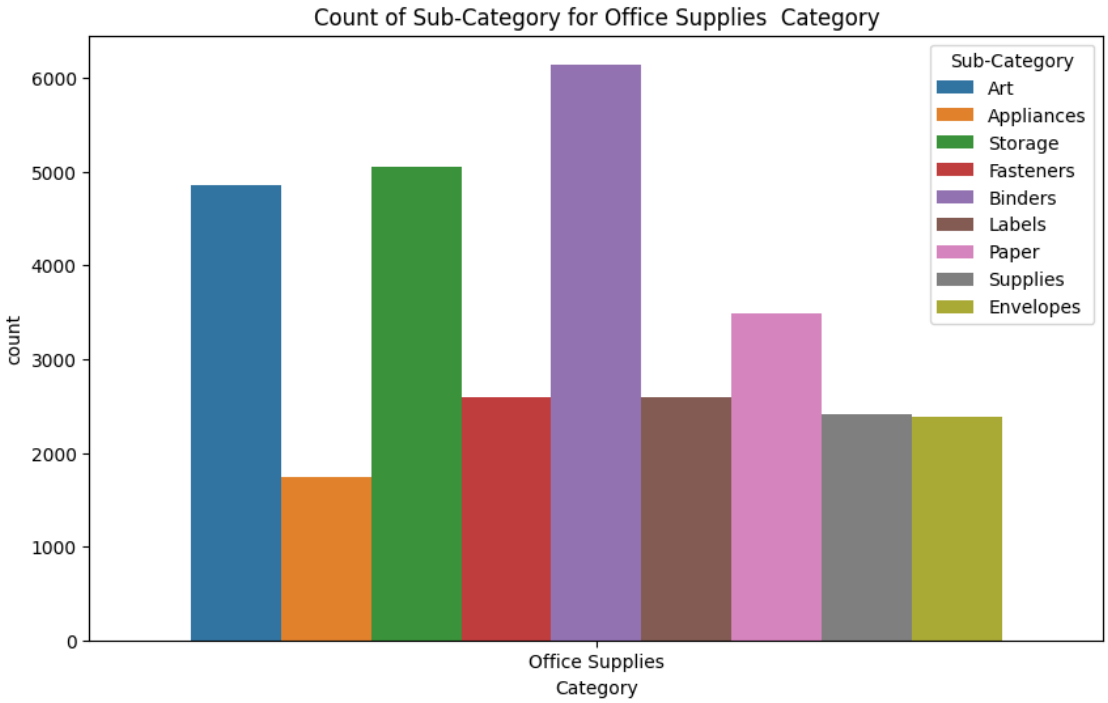
2.6 Count of Sub-Category for Technology Category

[15]:
```
plt.figure(figsize=(10,6))
sns.
 ↪countplot(x='Category',data=df[df['Category']=='Technology'],hue='Sub-Category')
plt.title("Count of Sub-Category for Technology  Category")
plt.savefig("Count of Sub-Category for Technology  Category.jpg")
plt.show()
```



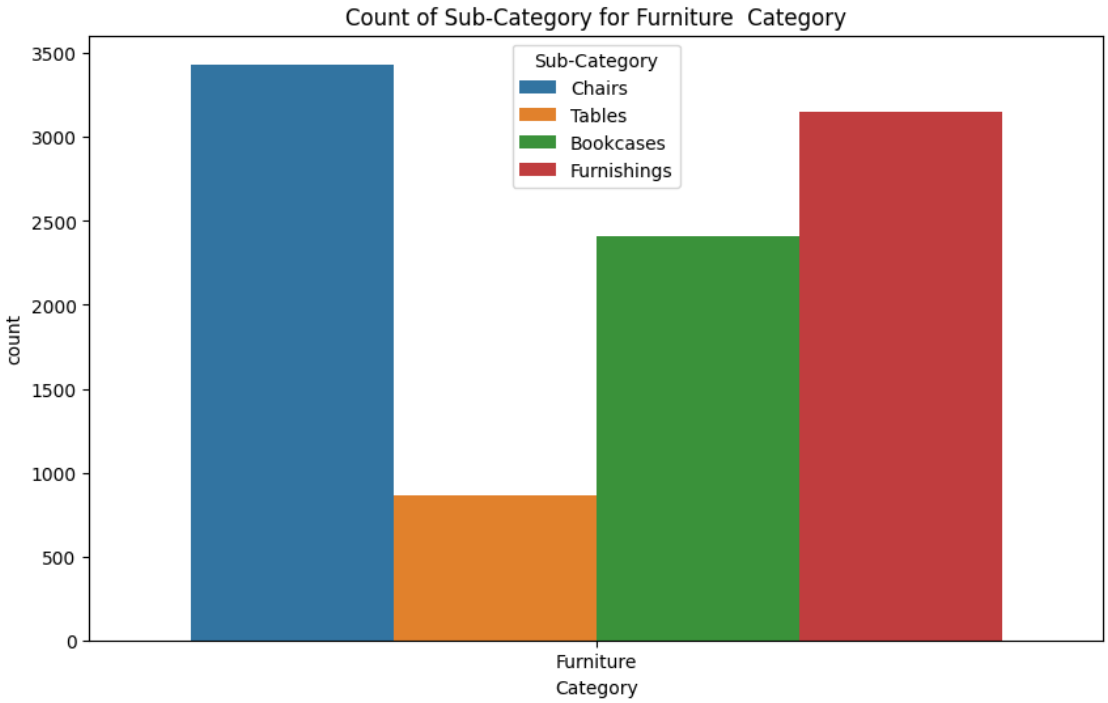
2.7 Count of Sub-Category for Office Supplies Category

[16]:
```
plt.figure(figsize=(10,6))
sns.countplot(x='Category',data=df[df['Category']=='Office␣
 ↪Supplies'],hue='Sub-Category')
plt.title("Count of Sub-Category for Office Supplies  Category")
plt.savefig("Count of Sub-Category for Office Supplies  Category.jpg")
plt.show()
```



2.8 Count of Sub-Category for Furniture Category

[17]:
```
plt.figure(figsize=(10,6))
sns.
  ↪countplot(x='Category',data=df[df['Category']=='Furniture'],hue='Sub-Category')
plt.title("Count of Sub-Category for Furniture  Category")
plt.savefig("Count of Sub-Category for Furniture  Category.jpg")
plt.show()
```

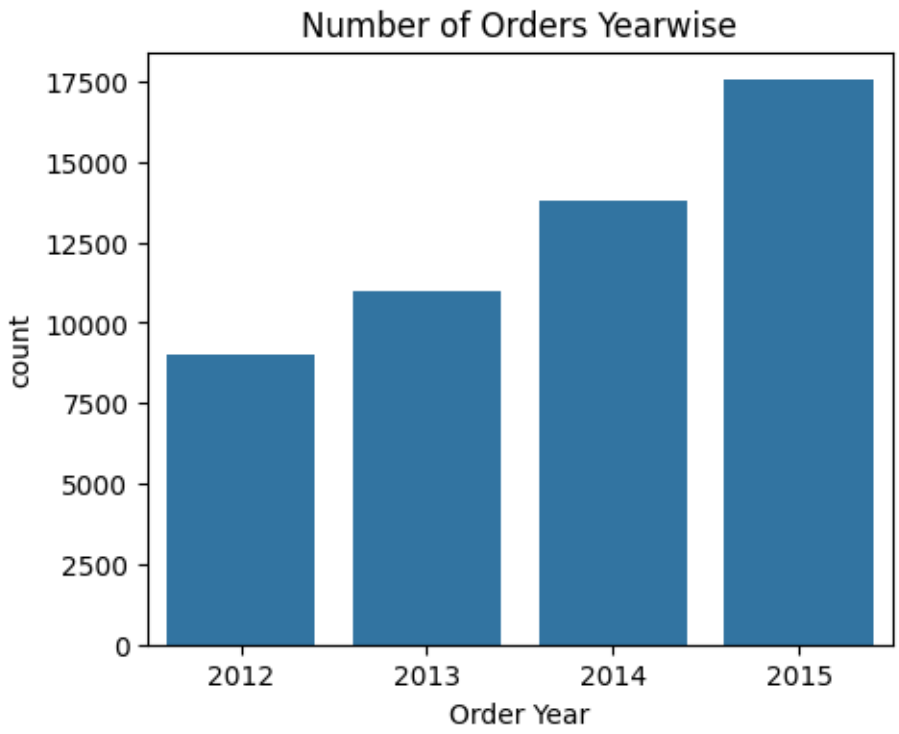


[18]:
```
## Separating Year from Order Date
df['Order Year']=df['Order Date'].dt.year
```

[19]:
```
df['Order Year'].value_counts()
```

[19]:
```
Order Year
2015    17531
2014    13799
2013    10962
2012     8998
Name: count, dtype: int64
```

[20]:
```
plt.figure(figsize=(5,4))
sns.countplot(x="Order Year",data=df)
plt.title("Number of Orders Yearwise")
plt.savefig("Number of Orders Yearwis.jpg")
plt.show()
```



[21]:
```
df['Category'].value_counts()
```

[21]:
```
Category
Office Supplies    31289
Technology         10141
Furniture           9860
Name: count, dtype: int64
```

[22]:
```
df['Order Priority'].value_counts()
```

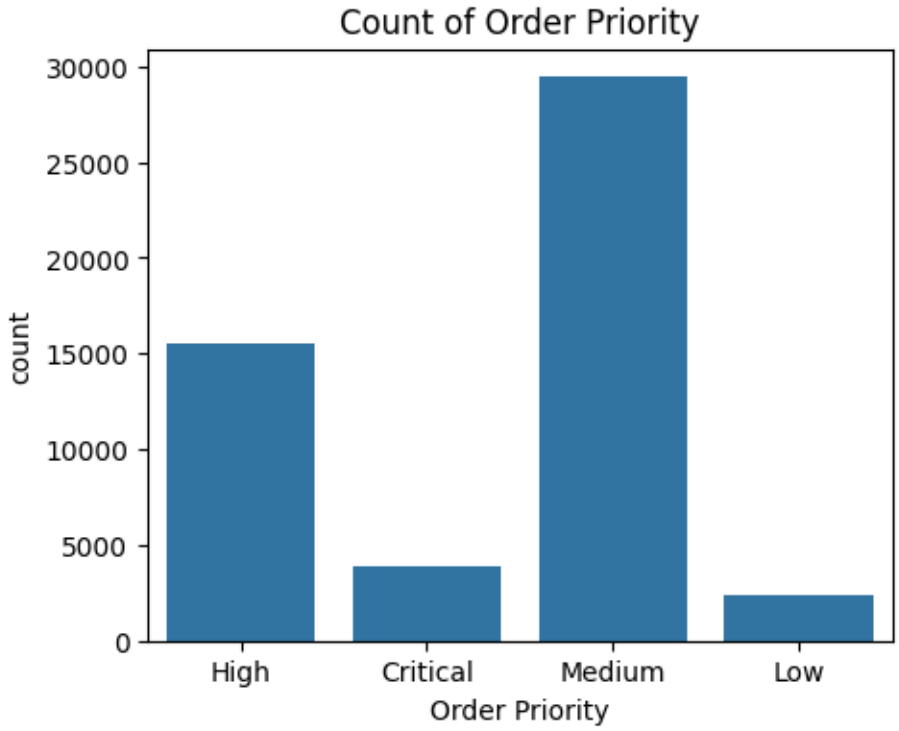
[22]:
```
Order Priority
Medium      29433
High        15501
Critical     3932
Low          2424
Name: count, dtype: int64
```

[23]:
```
df['Order Priority'].unique()
```

[23]:
```
array(['High', 'Critical', 'Medium', 'Low'], dtype=object)
```

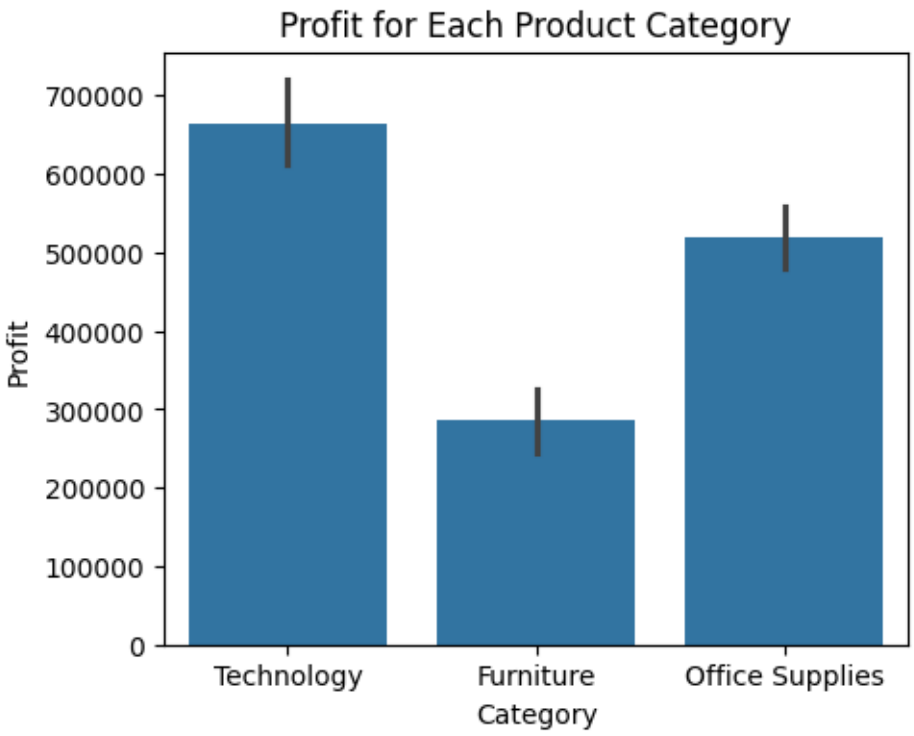
2.9 Order Priority

[24]:
```
plt.figure(figsize=(5,4))
sns.countplot(x="Order Priority",data=df)
plt.title("Count of Order Priority")
plt.savefig("Count of Order Priority .jpg")
plt.show()
```



2.10 Profit for Each Product Category

[25]:
```
plt.figure(figsize=(5,4))
sns.barplot(x='Category',y='Profit',data=df,estimator='sum')
plt.title("Profit for Each Product Category")
plt.savefig("Profit for Each Product Category.jpg")
plt.show()
```

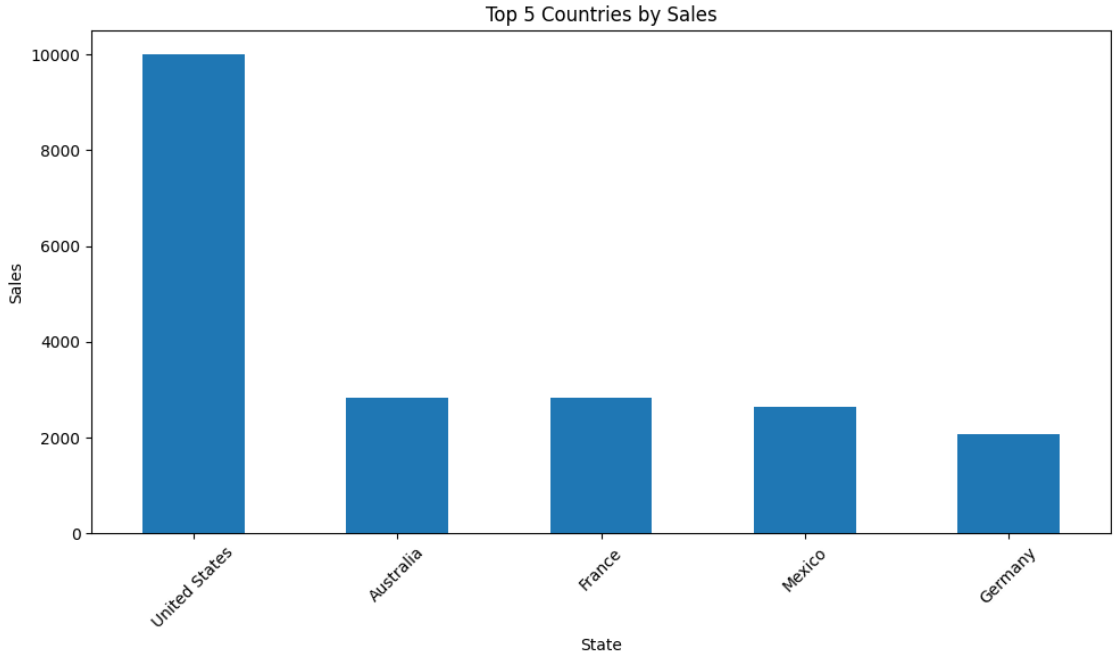


2.11 Top 5 Countries By Sales

[26]:
```
top_5_Country=df['Country'].value_counts().head(5)
top_5_Country
```

[26]:
```
Country
United States    9994
Australia        2837
France           2827
Mexico           2635
Germany          2063
Name: count, dtype: int64
```

[27]:
```
# Plotting the bar graph
plt.figure(figsize=(10, 6))
top_5_Country.plot(kind='bar')
plt.xlabel('State')
plt.ylabel('Sales')
plt.title('Top 5 Countries by Sales')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

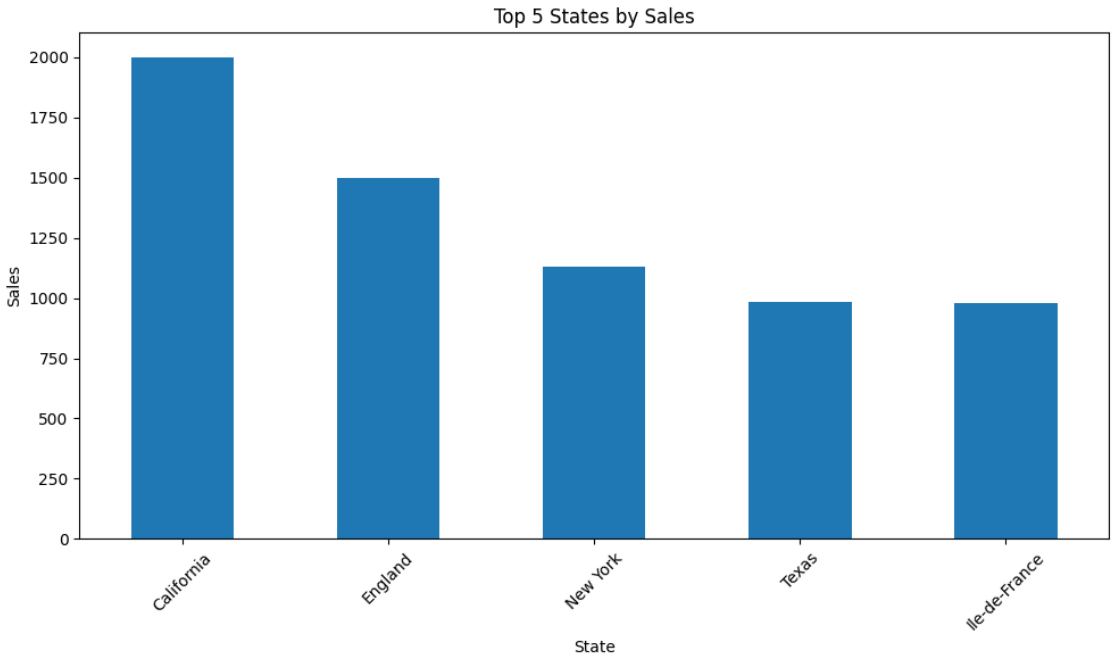


2.12 Top 5 States by Sales

[28]:
```
top_5_state=df['State'].value_counts().head(5)
top_5_state
```

[28]:
```
State
California       2001
England          1499
New York         1128
Texas             985
Ile-de-France     981
Name: count, dtype: int64
```

[29]:
```
# Plotting the bar graph
plt.figure(figsize=(10, 6))
top_5_state.plot(kind='bar')
plt.xlabel('State')
plt.ylabel('Sales')
plt.title('Top 5 States by Sales')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

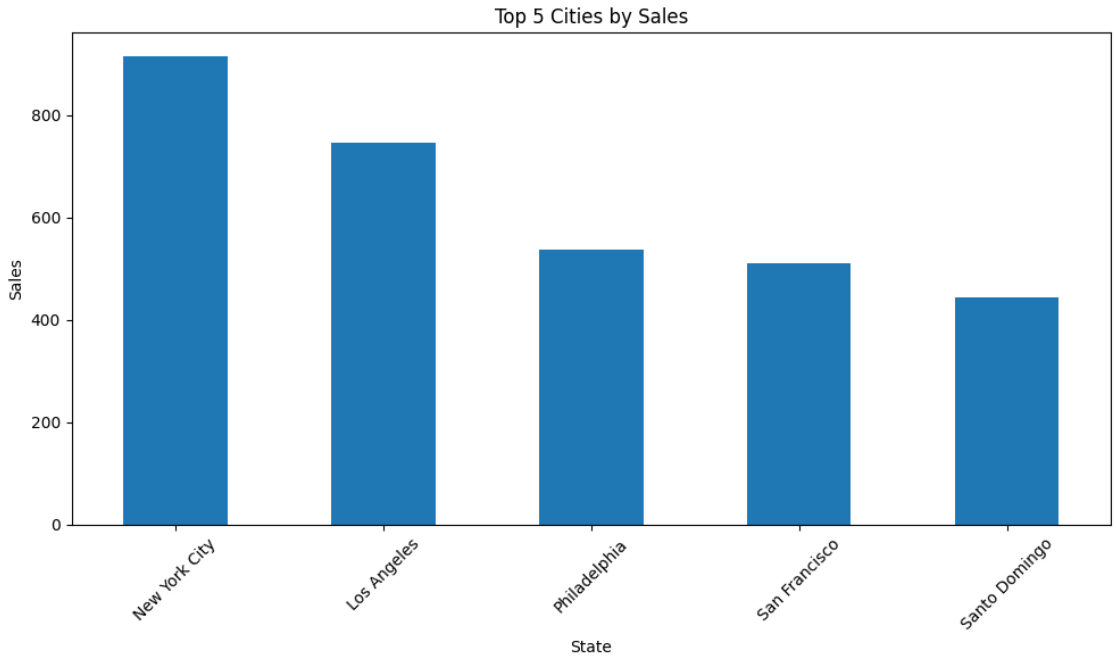


2.13 Top 5 Cities By Sales

[30]:
```
top_5_city=df['City'].value_counts().head(5)
top_5_city
```

[30]:
```
City
New York City    915
Los Angeles      747
Philadelphia     537
San Francisco    510
Santo Domingo    443
Name: count, dtype: int64
```

[31]:
```
# Plotting the bar graph
plt.figure(figsize=(10, 6))
top_5_city.plot(kind='bar')
plt.xlabel('State')
plt.ylabel('Sales')
plt.title('Top 5 Cities by Sales')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



2.14 Insights

Number of Orders has been increasing each year

Consumer has highest Customer Segment

Office Supplies has highest Product Category

Customers Prefer Standard class Shipping Mode

Under Standard Class Shipping Mode customers requirement is coming more from Office Supplies

For Technology Category Phones has high number of Sales

For Office Supplies Category Binders has high number of Sales

For Furniture Category chairs are having more sales

Profit wise Technology has more profit compared to others

New York , Los Angeles and Philadelphia has high number of Sales by city

California , England and New York has high sales by State

US , Australia and France has high sales by Country

2.15 Suggestion

Company should provide more discount on New York , Los Angeles and Philadelphia as purchasing power is more in order to further increase revenue

Company Needs to increase Binders , chairs and Phones amount for further increase of sales as demand is more

Company should Focus more on Consumer as customer segment is highest for this