In [ ]:
```
IMPORTING REQUIRED LIBRARIES
```

In [1]:
```
# Data Manipulation
import pandas as pd

# Data Visualization
import matplotlib.pyplot as plt
%matplotlib inline

import seaborn as sns
```

In [3]:
```
# Importing dataset
df = pd.read_excel(r"C:\Users\User\Downloads\superstore_sales.xlsx")
```

In [4]:
```
df.head() # First five rows of the dataset
```

Out[4]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country	market	region	...	category	sub_category
0	AG-2011-2040	2011-01-01	2011-01-06	Standard Class	Toby Braunhardt	Consumer	Constantine	Algeria	Africa	Africa	...	Office Supplies	Storage
1	IN-2011-47883	2011-01-01	2011-01-08	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	APAC	Oceania	...	Office Supplies	Supplies
2	HU-2011-1220	2011-01-01	2011-01-05	Second Class	Annie Thurman	Consumer	Budapest	Hungary	EMEA	EMEA	...	Office Supplies	Storage
3	IT-2011-3647632	2011-01-01	2011-01-05	Second Class	Eugene Moren	Home Office	Stockholm	Sweden	EU	North	...	Office Supplies	Paper
4	IN-2011-47883	2011-01-01	2011-01-08	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	APAC	Oceania	...	Furniture	Furnishings

5 rows × 21 columns

In [5]:
```
# Last five rows of the dataset
df.tail()
```

Out[5]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country	market	region	...	category	sub_catego
51285	CA-2014-115427	2014-12-31	2015-01-04	Standard Class	Erica Bern	Corporate	California	United States	US	West	...	Office Supplies	Binde
51286	MO-2014-2560	2014-12-31	2015-01-05	Standard Class	Liz Preis	Consumer	Souss-Massa-Draâ	Morocco	Africa	Africa	...	Office Supplies	Binde
51287	MX-2014-110527	2014-12-31	2015-01-02	Second Class	Charlotte Melton	Consumer	Managua	Nicaragua	LATAM	Central	...	Office Supplies	Labe
51288	MX-2014-114783	2014-12-31	2015-01-06	Standard Class	Tamara Dahlen	Consumer	Chihuahua	Mexico	LATAM	North	...	Office Supplies	Labe
51289	CA-2014-156720	2014-12-31	2015-01-04	Standard Class	Jill Matthias	Consumer	Colorado	United States	US	West	...	Office Supplies	Fastene

5 rows × 21 columns

In [6]:
```
# Shape of the dataset
df.shape
```

Out[6]:
```
(51290, 21)
```

In [7]:
```
# Columns present in the dataset
df.columns
```

Out[7]:
```
Index(['order_id', 'order_date', 'ship_date', 'ship_mode', 'customer_name',
       'segment', 'state', 'country', 'market', 'region', 'product_id',
       'category', 'sub_category', 'product_name', 'sales', 'quantity',
       'discount', 'profit', 'shipping_cost', 'order_priority', 'year'],
      dtype='object')
```

In [8]:
```
# A concise summary of the dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51290 entries, 0 to 51289
Data columns (total 21 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   order_id       51290 non-null  object
 1   order_date     51290 non-null  datetime64[ns]
 2   ship_date      51290 non-null  datetime64[ns]
 3   ship_mode      51290 non-null  object
 4   customer_name  51290 non-null  object
 5   segment        51290 non-null  object
 6   state          51290 non-null  object
 7   country        51290 non-null  object
 8   market         51290 non-null  object
 9   region         51290 non-null  object
 10  product_id     51290 non-null  object
 11  category       51290 non-null  object
 12  sub_category   51290 non-null  object
 13  product_name   51290 non-null  object
 14  sales          51290 non-null  float64
 15  quantity       51290 non-null  int64
 16  discount       51290 non-null  float64
 17  profit         51290 non-null  float64
 18  shipping_cost  51290 non-null  float64
 19  order_priority  51290 non-null  object
 20  year           51290 non-null  int64
dtypes: datetime64[ns](2), float64(4), int64(2), object(13)
memory usage: 8.2+ MB
```

In [9]:
```
# Checking missing values
df.isna().sum()
```

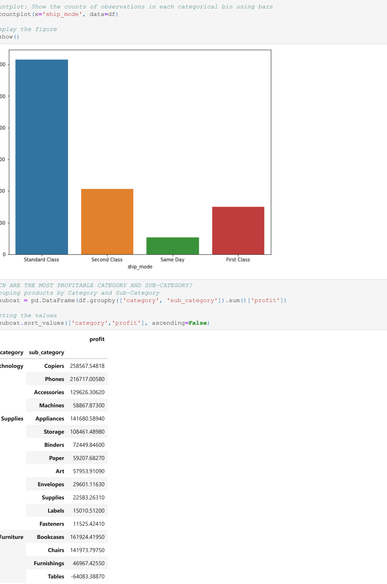
Out[9]:
```
order_id         0
order_date       0
ship_date        0
ship_mode        0
customer_name    0
segment          0
state            0
country          0
market           0
region           0
product_id       0
category         0
sub_category     0
product_name     0
sales            0
quantity         0
discount         0
profit           0
shipping_cost    0
order_priority   0
year             0
dtype: int64
```

In [11]:
```
# Generating descriptive statistics summary
df.describe().round()
```

Out[11]:

	sales	quantity	discount	profit	shipping_cost	year
count	51290.0	51290.0	51290.0	51290.0	51290.0	51290.0
mean	246.0	3.0	0.0	29.0	26.0	2013.0
std	488.0	2.0	0.0	174.0	57.0	1.0
min	0.0	1.0	0.0	-6600.0	0.0	2011.0
25%	31.0	2.0	0.0	0.0	3.0	2012.0
50%	85.0	3.0	0.0	9.0	8.0	2013.0
75%	251.0	5.0	0.0	37.0	24.0	2014.0
max	22638.0	14.0	1.0	8400.0	934.0	2014.0

In [15]:
```
#WHAT IS THE OVERALL SALES TREND?
# Getting month_year from order_date
df['month_year'] = df['order_date'].apply(lambda x: x.strftime('%Y-%m'))
# grouping month_year by sales
df_temp = df.groupby('month_year').sum()['sales'].reset_index()
# Setting the figure size
plt.figure(figsize=(16, 5))
plt.plot(df_temp['month_year'], df_temp['sales'], color='#b80045')
plt.xticks(rotation='vertical', size=8)
plt.show()
```



In [16]:
```
#WHICH ARE THE TOP 10 PRODUCTS BY SALES?
# Grouping products by sales
prod_sales = pd.DataFrame(df.groupby('product_name').sum()['sales'])

# Sorting the dataframe in descending order
prod_sales.sort_values(by='sales', inplace=True, ascending=False)

# Top 10 products by sales
prod_sales[:10]
```

Out[16]:

	sales
product_name	
Apple Smart Phone, Full Size	86935.7786
Cisco Smart Phone, Full Size	76441.5306
Motorola Smart Phone, Full Size	73156.3030
Nokia Smart Phone, Full Size	71904.5555
Canon imageCLASS 2200 Advanced Copier	61599.8240
Hon Executive Leather Armchair, Adjustable	58193.4841
Office Star Executive Leather Armchair, Adjustable	50661.6840
Harbour Creations Executive Leather Armchair, Adjustable	50121.5160
Samsung Smart Phone, Cordless	48653.4600
Nokia Smart Phone, with Caller ID	47877.7857

In [28]:
```
#WHICH ARE THE MOST SELLING PRODUCTS?
# Grouping products by Quantity
best_selling_prods = pd.DataFrame(df.groupby('product_name').sum()['quantity'])

# Sorting the dataframe in descending order
best_selling_prods.sort_values(by='quantity', inplace=True, ascending=False)

# Most selling products
best_selling_prods[:10]
```

Out[28]:

	quantity
product_name	
Staples	876
Cardinal Index Tab, Clear	337
Eldon File Cart, Single Width	321
Rogers File Cart, Single Width	262
Sanford Pencil Sharpener, Water Color	259
Stockwell Paper Clips, Assorted Sizes	253
Avery Index Tab, Clear	252
Ibico Index Tab, Clear	251
Smead File Cart, Single Width	250
Stanley Pencil Sharpener, Water Color	242

In [18]:
```
#WHAT IS THE MOST PREFERRED SHIP MODE?
# Setting the figure size
plt.figure(figsize=(15, 8))

# countplot: Show the counts of observations in each categorical bin using bars
sns.countplot(x='ship_mode', data=df)

# Display the figure
plt.show()
```


In [26]:
```
#WHICH ARE THE MOST PROFITABLE CATEGORY AND SUB-CATEGORY?
# Grouping products by Category and Sub-Category
cat_subcat = pd.DataFrame(df.groupby(['category', 'sub_category']).sum()['profit'])

# Sorting the values
cat_subcat.sort_values(['category','profit'], ascending=False)
```

Out[26]:

		profit
category	**sub_category**	
Technology	**Copiers**	258567.54818
	Phones	216717.00580
	Accessories	129626.30620
	Machines	58867.87300
Office Supplies	**Appliances**	141680.58940
	Storage	108461.48980
	Binders	72449.84600
	Paper	59207.68270
	Art	57953.91090
	Envelopes	29601.11630
	Supplies	22583.26310
	Labels	15010.51200
	Fasteners	11525.42410
Furniture	**Bookcases**	161924.41950
	Chairs	141973.79750
	Furnishings	46967.42550
	Tables	-64083.38870