Data Analysis - Sales (Walmart - USA)

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Objective

1)-What is the overall sales trend?

2)-Which are the Top 10 products by sales?

3)-Which are the Most Selling Products?

4)-Which is the most preferred Ship Mode?

5)-Which are the Most Profitable Category and Sub-Category?

IMPORTING REQUIRED LIBRARIES

In [2]:
```
# Data Manipulation
import pandas as pd

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

import seaborn as sns
```

IMPORTING THE DATASET

In [12]:
```
# Importing os directory
import os
os.getcwd()
```

Out[12]:
```
'C:\\Users\\HP'
```

In [16]:
```
# Importing dataset- Dueto larhe file it can take time to load )
df = pd.read_excel('superstore_sales.xlsx')
```

DATA AUDIT

In [17]:
```
# First five rows of the dataset
df.head()
```

Out[17]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country	ma
0	AG-2011-2040	2011-01-01	2011-01-06	Standard Class	Toby Braunhardt	Consumer	Constantine	Algeria	A

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country	ma
1	IN-2011-47883	2011-01-01	2011-01-08	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	A
2	HU-2011-1220	2011-01-01	2011-01-05	Second Class	Annie Thurman	Consumer	Budapest	Hungary	E
3	IT-2011-3647632	2011-01-01	2011-01-05	Second Class	Eugene Moren	Home Office	Stockholm	Sweden	
4	IN-2011-47883	2011-01-01	2011-01-08	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	A

5 rows × 21 columns

In [18]:
```
# Last five rows of the dataset
df.tail()
```

Out[18]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country
51285	CA-2014-115427	2014-12-31	2015-01-04	Standard Class	Erica Bern	Corporate	California	United States
51286	MO-2014-2560	2014-12-31	2015-01-05	Standard Class	Liz Preis	Consumer	Souss-Massa-Draâ	Morocco
51287	MX-2014-110527	2014-12-31	2015-01-02	Second Class	Charlotte Melton	Consumer	Managua	Nicaragua
51288	MX-2014-114783	2014-12-31	2015-01-06	Standard Class	Tamara Dahlen	Consumer	Chihuahua	Mexico
51289	CA-2014-156720	2014-12-31	2015-01-04	Standard Class	Jill Matthias	Consumer	Colorado	United States

5 rows × 21 columns

In [19]:
```
# Shape of the dataset
df.shape
```

Out[19]:
```
(51290, 21)
```

In [20]:
```
# Columns present in the dataset
df.columns
```

Out[20]:
```
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 [21]:

```
# 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 [22]:

```
# Checking missing values
df.isna().sum()
```

Out[22]:

```
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 [23]:
```
# Generating descriptive statistics summary
df.describe().round()
```

Out[23]:

	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

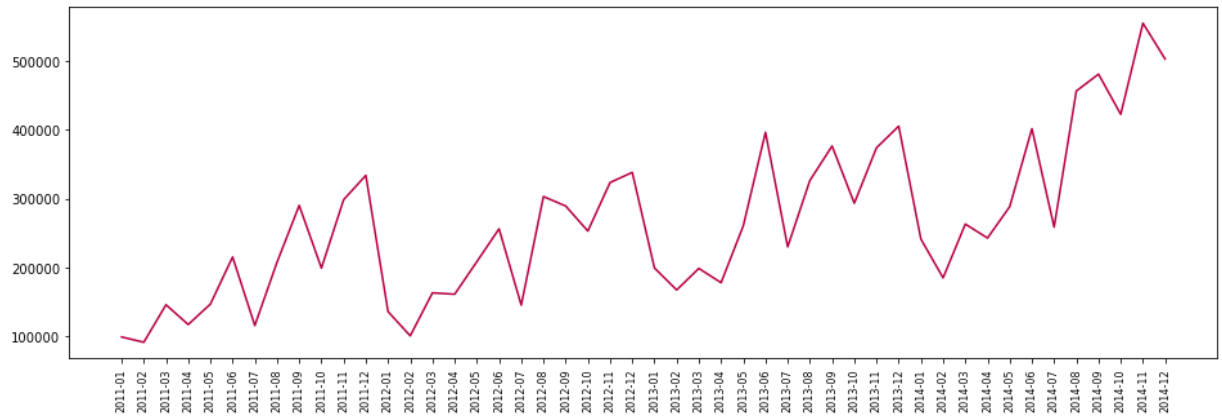
EXPLORATORY DATA ANALYSIS - (EDA)

QUE 1)- WHAT IS THE OVERALL SALES TREND?

In [24]:
```
# Getting month year from order_date
df['month_year'] = df['order_date'].apply(lambda x: x.strftime('%Y-%m'))
```

In [25]:
```
# grouping month_year by sales
df_temp = df.groupby('month_year').sum()['sales'].reset_index()
```

In [26]:
```
# 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()
```



QUE 2)-WHICH ARE THE TOP 10 PRODUCTS BY SALES?

In [27]:
```
# 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[27]:

product_name	sales
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

QUE 3)-WHICH ARE THE MOST SELLING PRODUCTS?

In [28]:

```
# 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]:

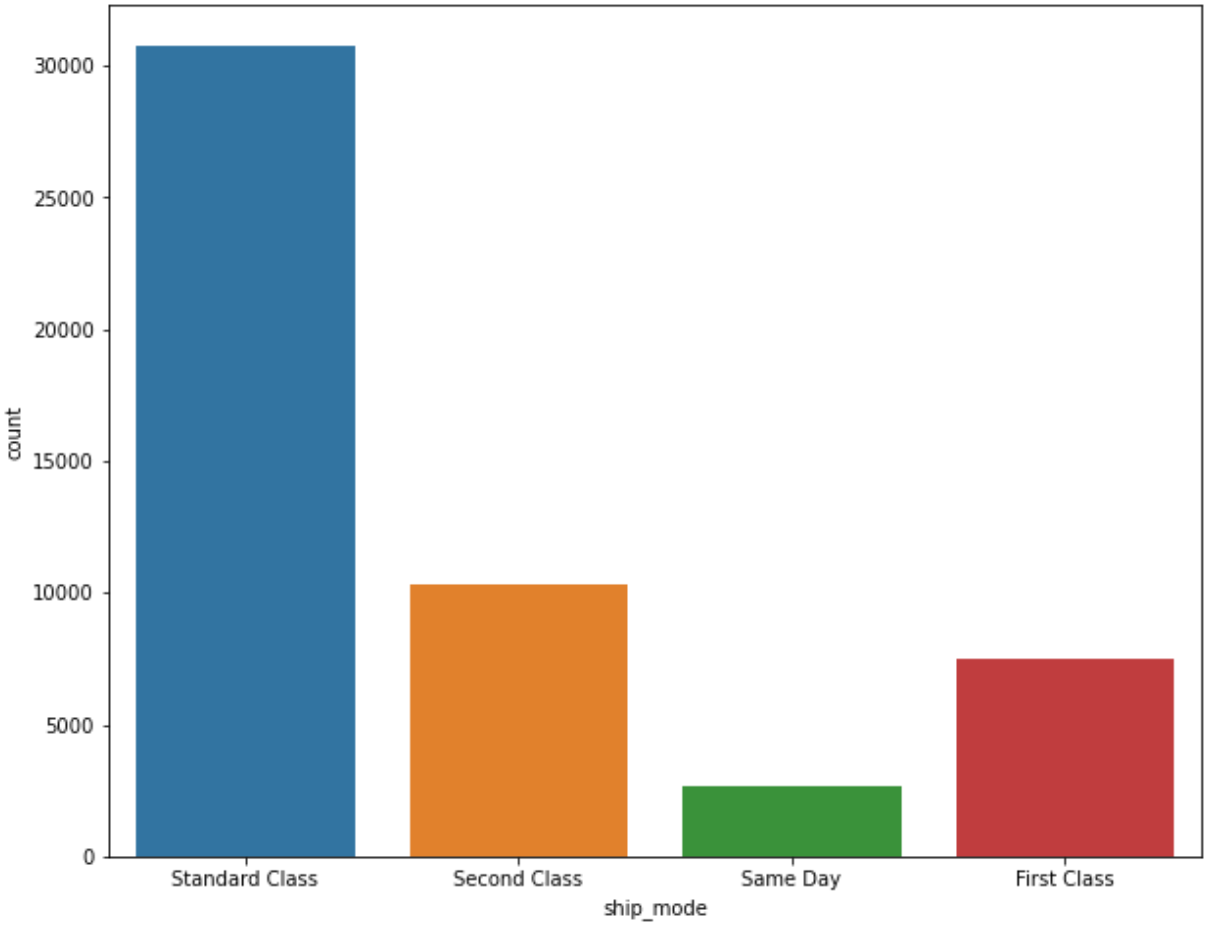
product_name	quantity
Staples	876
Cardinal Index Tab, Clear	337
Eldon File Cart, Single Width	321
Rogers File Cart, Single Width	262
Sanford Pencil Sharpener, Water Color	259
Stockwell Paper Clips, Assorted Sizes	253
Avery Index Tab, Clear	252
Ibico Index Tab, Clear	251
Smead File Cart, Single Width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

QUE 4)-WHAT IS THE MOST PREFERRED SHIP MODE?

In [29]:
```
# Setting the figure size
plt.figure(figsize=(10, 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()
```



QUE 5)-WHICH ARE THE MOST PROFITABLE CATEGORY AND SUB-CATEGORY?

In [30]:
```
# 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[30]:

		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

		profit
category	**sub_category**	
	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

Answer We found

Q1-What is the overall sales trend? ----> Ans -It is increasing every Quarter

Q2-Which are the Top 10 products by sales? ----> Ans-Apple Smart Phone , Cisco Smart Phone , Motorola Smart Phone---so on

Q3-Which are the Most Selling Products?----> Ans-Staples, - Cardinal Index Tab , Eldon File Cart, Single ---so on

Q4-Which is the most preferred Ship Mode?----> Ans - Standard , Second , First , Same Day

Q5-Which are the Most Profitable Category and Sub-Category?----> Ans - Technology , office supplies , furtiture

Output & Conclusion

As market is increasing as we see in last quarters it is increasing it means there is demand and we have to focus on FG stock of the top selling product which consist majority %age of the sale value . and as there is demand in Technology sector we have to focus on that and there assecories . and we need to prefer stand shipment .

thanks..