MINI PROJECT TO CLEAN AND BUILD A DASH BOARD

In [113…
```
#The aim  of this project is to clean and preprocess the data, uncover the insights in
```

In [114…
```
# importing the data to notebook
import pandas as pd
import numpy as np
import os
import matplotlib.pyplot as plt
import seaborn as sns
```

In [115…
```
df = pd.read_csv(r"C:\Users\USER\Documents\WORKSPACE\Visualization\Data\superstore_sal
```

In [116…
```
df
```

Out[116]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country
0	AG-2011-2040	1/1/2011	1/6/2011	Standard Class	Toby Braunhardt	Consumer	Constantine	Algeria
1	IN-2011-47883	1/1/2011	1/8/2011	Standard Class	Joseph Holt	Consumer	New South Wales	Australia
2	HU-2011-1220	1/1/2011	1/5/2011	Second Class	Annie Thurman	Consumer	Budapest	Hungary
3	IT-2011-3647632	1/1/2011	1/5/2011	Second Class	Eugene Moren	Home Office	Stockholm	Sweden
4	IN-2011-47883	1/1/2011	1/8/2011	Standard Class	Joseph Holt	Consumer	New South Wales	Australia
...	...	...	...	...	...	...	...	...
51399	CA-2014-115427	12/31/2014	1/4/2015	Standard Class	Erica Bern	Corporate	California	United States
51400	MO-2014-2560	12/31/2014	1/5/2015	Standard Class	Liz Preis	Consumer	Souss-Massa-Draâ	Morocco
51401	MX-2014-110527	12/31/2014	1/2/2015	Second Class	Charlotte Melton	Consumer	Managua	Nicaragua
51402	MX-2014-114783	12/31/2014	1/6/2015	Standard Class	Tamara Dahlen	Consumer	Chihuahua	Mexico
51403	CA-2014-156720	12/31/2014	1/4/2015	Standard Class	Jill Matthias	Consumer	Colorado	United States

51404 rows × 21 columns

In [117…

```
#inspecting the structure and properties of our data .
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51404 entries, 0 to 51403
Data columns (total 21 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   order_id        51404 non-null  object
 1   order_date      51404 non-null  object
 2   ship_date       51404 non-null  object
 3   ship_mode       51404 non-null  object
 4   customer_name   51404 non-null  object
 5   segment         51404 non-null  object
 6   state           51404 non-null  object
 7   country         51404 non-null  object
 8   market          51404 non-null  object
 9   region          51404 non-null  object
 10  product_id      51404 non-null  object
 11  category        51404 non-null  object
 12  sub_category    51404 non-null  object
 13  product_name    51404 non-null  object
 14  sales           51399 non-null  object
 15  quantity        51401 non-null  float64
 16  discount        51400 non-null  float64
 17  profit          51401 non-null  float64
 18  shipping_cost   51402 non-null  float64
 19  order_priority  51404 non-null  object
 20  year            51404 non-null  int64
dtypes: float64(4), int64(1), object(16)
memory usage: 8.2+ MB
```

In [118…

```
# To get the list of my columns to know what is going on in my data
df.columns
```

Out[118]:

```
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 [119…

```
# Getting quantity columns and checking the nature of the data in that column
df['quantity']
```

Out[119]:

```
0        2.0
1        3.0
2        4.0
3        3.0
4        5.0
        ...
51399    2.0
51400    1.0
51401    3.0
51402    1.0
51403    3.0
Name: quantity, Length: 51404, dtype: float64
```

In [120…

```
# Getting discountcolumns and checking the nature of the data in that column
df['discount']
```

Out[120]:
```
0        0.0
1        0.1
2        0.0
3        0.5
4        0.1
        ...
51399    0.2
51400    0.0
51401    0.0
51402    0.0
51403    0.2
Name: discount, Length: 51404, dtype: float64
```

In [121…
```
# Getting year columns and checking the nature of the data in that column
df['year']
```

Out[121]:
```
0        2011
1        2011
2        2011
3        2011
4        2011
         ...
51399    2014
51400    2014
51401    2014
51402    2014
51403    2014
Name: year, Length: 51404, dtype: int64
```

In [122…
```
# Inspecting the column for their unique values
df['profit']
```

Out[122]:
```
0        106.1400
1         36.0360
2         29.6400
3        -26.0550
4         37.7700
           ...
51399      4.5188
51400      0.4200
51401     12.3600
51402      0.5600
51403     -0.6048
Name: profit, Length: 51404, dtype: float64
```

In [158…
```
#checking for unique value for sales
df['sales'].unique()
```

Out[158]:
```
array([ 408.,  120.,   66., ..., 1763., 1821., 1831.])
```

In [125…
```
# converting the sales colounm from strings to float
```

In [126…
```
df.sales.unique()
```

Out[126]:
```
array(['408', '120', '66', ..., '1,763', '1,821', '1,831'], dtype=object)
```

In [127…
```
df['sales'] = df['sales'].str.replace(',', '').astype(float)
```

In [128…
```
# cheaking to see that the sales column is converted to flaot
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51404 entries, 0 to 51403
Data columns (total 21 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   order_id        51404 non-null  object 
 1   order_date      51404 non-null  object 
 2   ship_date       51404 non-null  object 
 3   ship_mode       51404 non-null  object 
 4   customer_name   51404 non-null  object 
 5   segment         51404 non-null  object 
 6   state           51404 non-null  object 
 7   country         51404 non-null  object 
 8   market          51404 non-null  object 
 9   region          51404 non-null  object 
 10  product_id      51404 non-null  object 
 11  category        51404 non-null  object 
 12  sub_category    51404 non-null  object 
 13  product_name    51404 non-null  object 
 14  sales           51399 non-null  float64
 15  quantity        51401 non-null  float64
 16  discount        51400 non-null  float64
 17  profit          51401 non-null  float64
 18  shipping_cost   51402 non-null  float64
 19  order_priority  51404 non-null  object 
 20  year            51404 non-null  int64  
dtypes: float64(5), int64(1), object(15)
memory usage: 8.2+ MB
```

In [129…
```
#checking for missing values
df.isna().sum()
```

Out[129]:
```
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             5
quantity          3
discount          4
profit            3
shipping_cost     2
order_priority    0
year              0
dtype: int64
```

In [130…
```
#droping the missing values because it will affect the outcome of my work
df=df.dropna()
```

In [131…
```
df.isna().sum()
```

Out[131]:
```
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 [132…
```
#checking for duplicate
df.duplicated().sum()
```

Out[132]:
```
114
```

In [133…
```
#droping duplicate
df = df.drop_duplicates()
```

In [136…
```
#Grouping the data for total sales
df["Total_sales"]= df["sales"]*df["quantity"]
```

In [137…
```
#checking to see if the total sales have been added to the coloum
print(df.columns)
```

```
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',
       'Total_sales'],
      dtype='object')
```

In [138…
```
#Grouping the total sales by years
sales_df = df.groupby("year")["Total_sales"].sum().reset_index()
profit_df= df.groupby("year")["profit"].sum().reset_index()
```

In [139…
```
df.head()
```

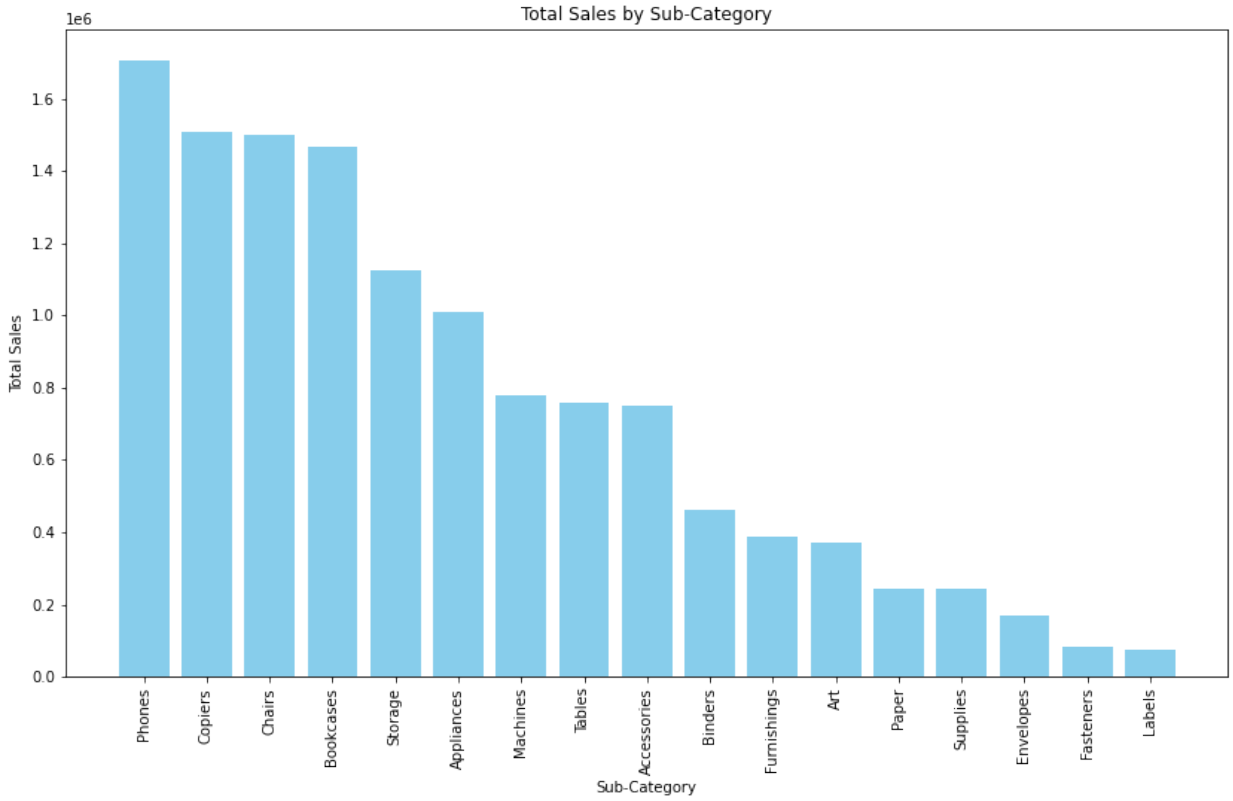
Out[139]:

	order_id	order_date	ship_date	ship_mode	customer_name	segment	state	country	marl
0	AG-2011-2040	1/1/2011	1/6/2011	Standard Class	Toby Braunhardt	Consumer	Constantine	Algeria	Afr
1	IN-2011-47883	1/1/2011	1/8/2011	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	AP
2	HU-2011-1220	1/1/2011	1/5/2011	Second Class	Annie Thurman	Consumer	Budapest	Hungary	EM
3	IT-2011-3647632	1/1/2011	1/5/2011	Second Class	Eugene Moren	Home Office	Stockholm	Sweden	
4	IN-2011-47883	1/1/2011	1/8/2011	Standard Class	Joseph Holt	Consumer	New South Wales	Australia	AP

5 rows × 22 columns

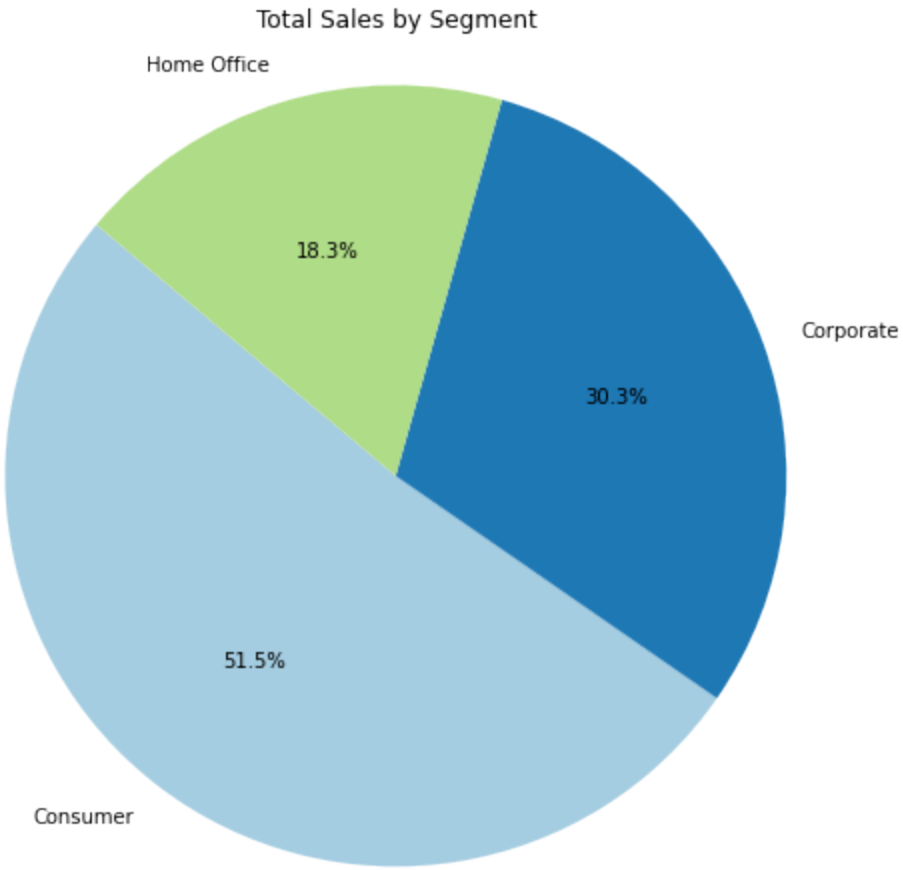
In [27]:
```
# Group by sub-category and sum the sales
total_sales_by_sub_category = df.groupby('sub_category')['sales'].sum().reset_index()

# Sort the data by total sales for better visualization
total_sales_by_sub_category = total_sales_by_sub_category.sort_values(by='sales', asce
```

In [140…
```
# ploting the total sales by sub-category
plt.figure(figsize=(14, 8))
plt.bar(total_sales_by_sub_category['sub_category'], total_sales_by_sub_category['sale
plt.title('Total Sales by Sub-Category')
plt.xlabel('Sub-Category')
plt.ylabel('Total Sales')
plt.xticks(rotation=90)
plt.show()
```



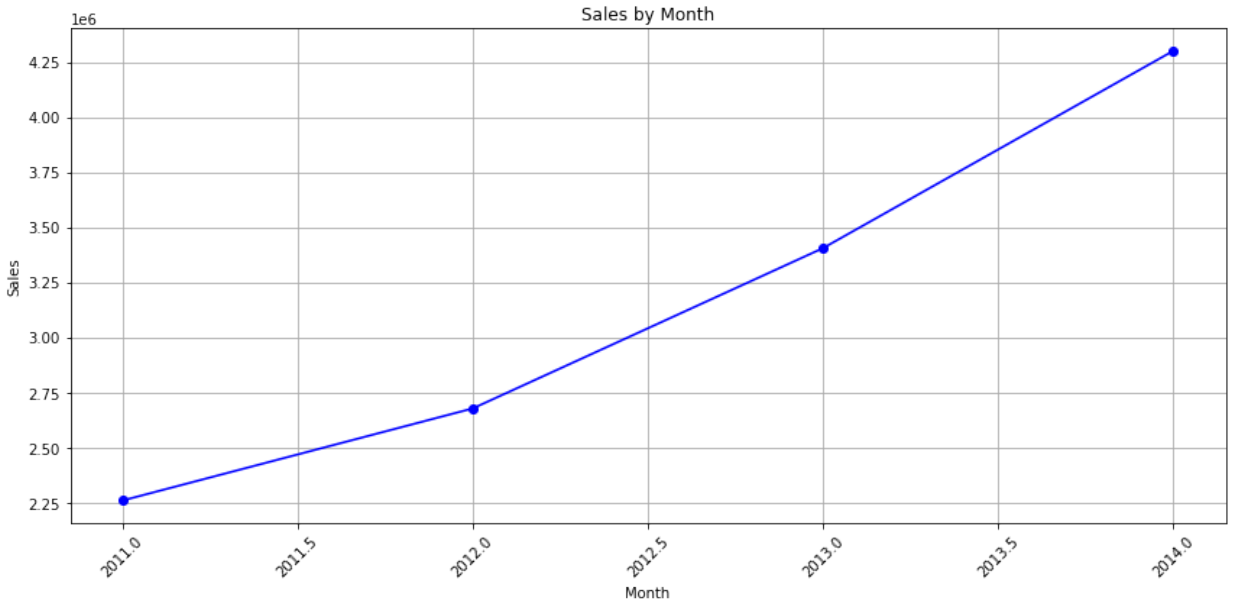
In [141…
```
# Group by segment and sum the sales
total_sales_by_segment = df.groupby('segment')['sales'].sum().reset_index()
```

In [142…
```
# Ploting the data
plt.figure(figsize=(10, 8))
plt.pie(total_sales_by_segment['sales'], labels=total_sales_by_segment['segment'], aut
plt.title('Total Sales by Segment')
plt.axis('equal')
plt.show()
```



In [143…
```
# Aggregate sales data by month
monthly_sales = df.groupby('year')['sales'].sum().reset_index()
```

In [144…
```
# Ploting the data
plt.figure(figsize=(12, 6))
plt.plot(monthly_sales['year'], monthly_sales['sales'], marker='o', linestyle='-', col
plt.title('Sales by Month')
plt.xlabel('Month')
plt.ylabel('Sales')
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```



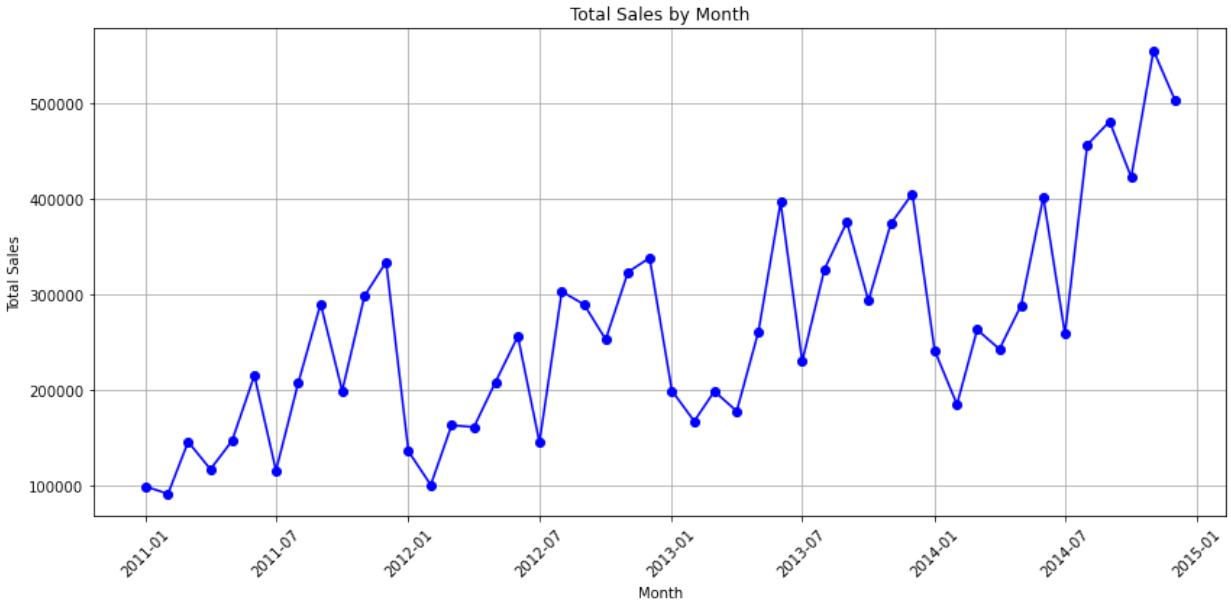
In [145…
```
# Convert the order_date column to datetime
df['order_date'] = pd.to_datetime(df['order_date'])
```

In [146…
```
# Extract the month and year from the date column
df['year_month'] = df['order_date'].dt.to_period('M')
```

In [147…
```
# Aggregate sales data by month
monthly_sales = df.groupby('year_month')['sales'].sum().reset_index()
```

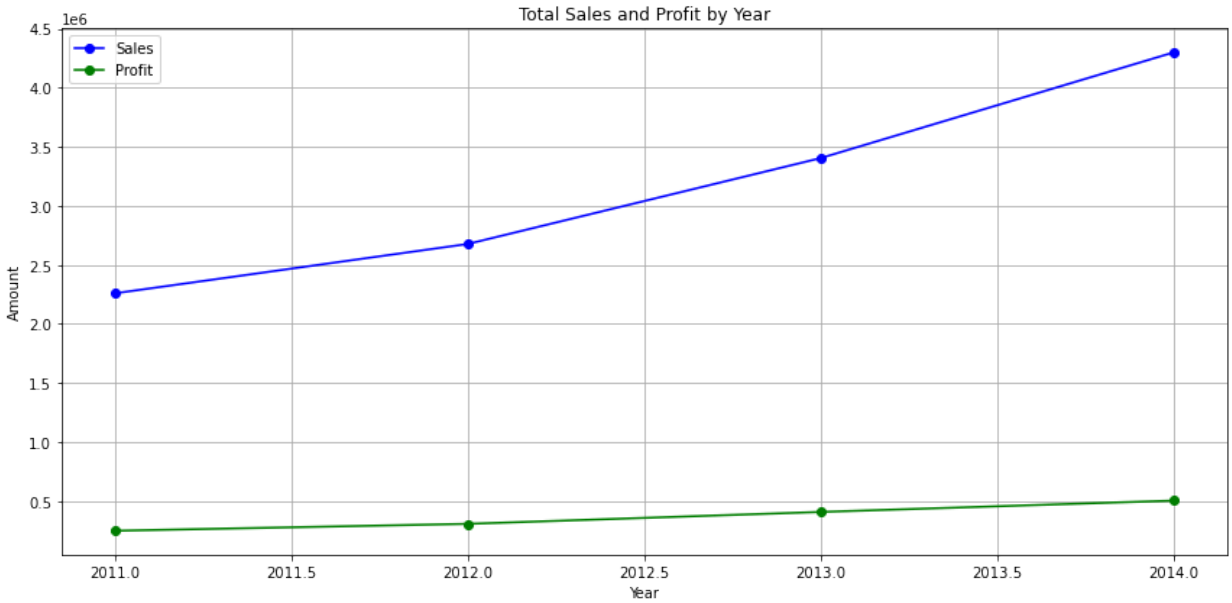
In [148…
```
# Convert the 'year_month' to a datetime object for plotting
monthly_sales['year_month'] = monthly_sales['year_month'].dt.to_timestamp()
```

In [149…
```
# Ploting the data
plt.figure(figsize=(12, 6))
plt.plot(monthly_sales['year_month'], monthly_sales['sales'], marker='o', linestyle='-
plt.title('Total Sales by Month')
plt.xlabel('Month')
plt.ylabel('Total Sales')
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```



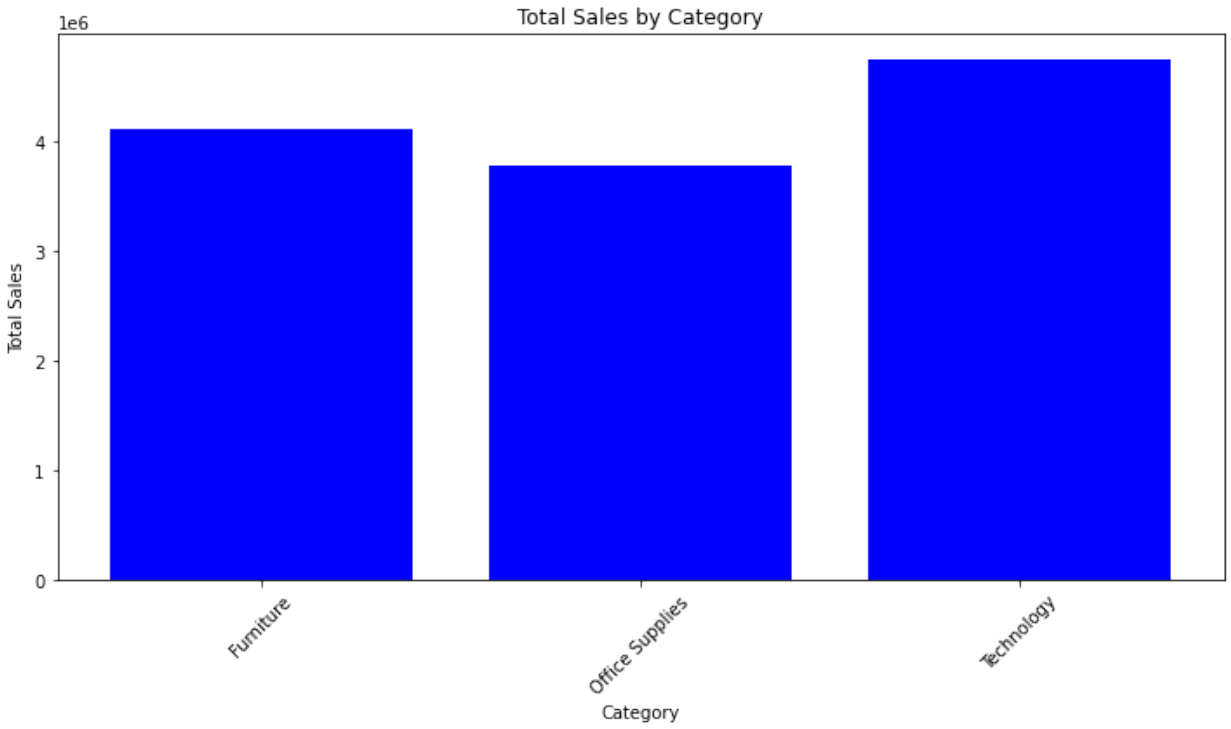
In [150…

```
# Convert the order_date column to datetime
df['order_date'] = pd.to_datetime(df['order_date'])

# Extract the year from the date column
df['year'] = df['order_date'].dt.year

# Aggregate sales and profit data by year
yearly_data = df.groupby('year')[['sales', 'profit']].sum().reset_index()

# Plot the data
plt.figure(figsize=(12, 6))
plt.plot(yearly_data['year'], yearly_data['sales'], marker='o', linestyle='-', color='
plt.plot(yearly_data['year'], yearly_data['profit'], marker='o', linestyle='-', color=
plt.title('Total Sales and Profit by Year')
plt.xlabel('Year')
plt.ylabel('Amount')
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



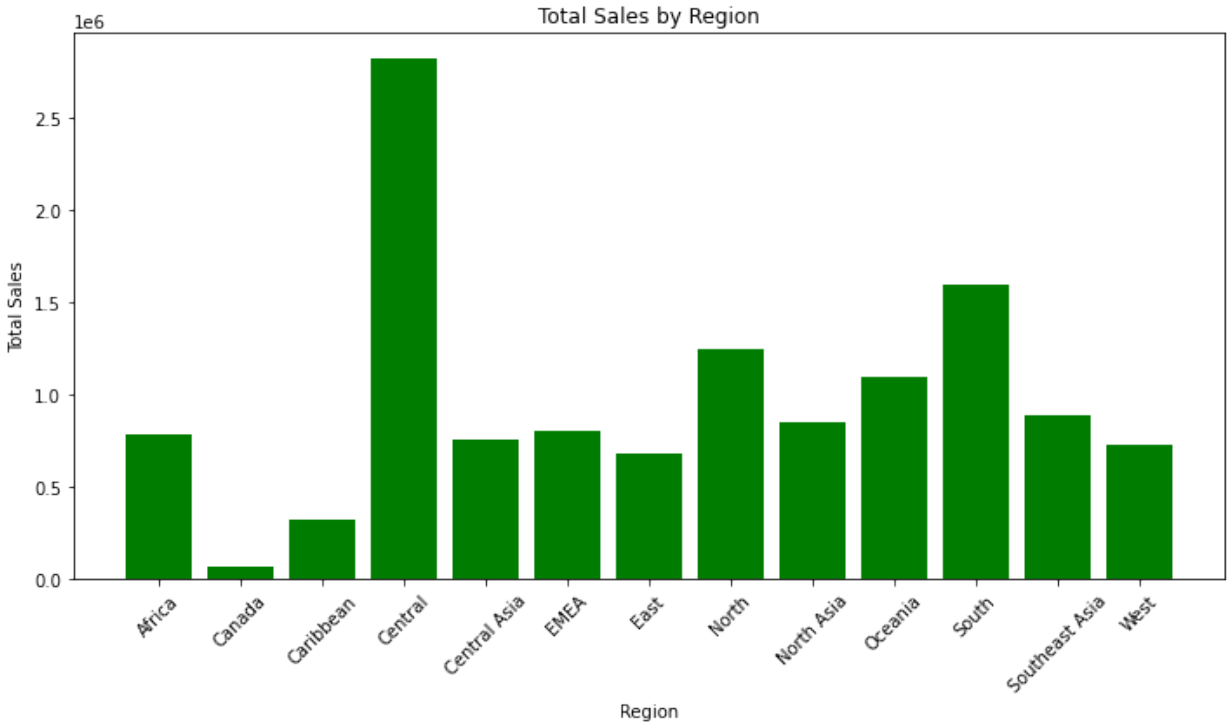
In [151…

```
 #Aggregate total sales by category
category_sales = df.groupby('category')['sales'].sum().reset_index()

# Ploting the data
plt.figure(figsize=(10, 6))
plt.bar(category_sales['category'], category_sales['sales'], color='blue')
plt.title('Total Sales by Category')
plt.xlabel('Category')
plt.ylabel('Total Sales')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



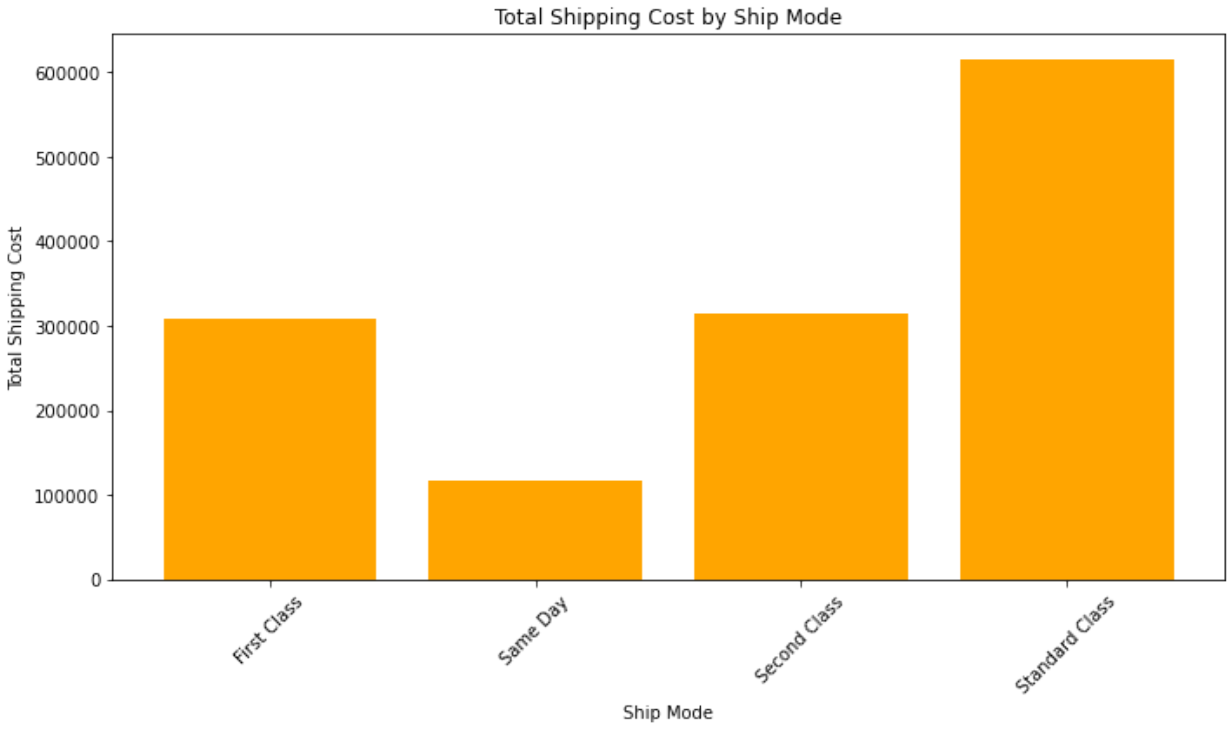
In [152…

```
# Aggregate total sales by region
region_sales = df.groupby('region')['sales'].sum().reset_index()

# Plot the data
plt.figure(figsize=(10, 6))
plt.bar(region_sales['region'], region_sales['sales'], color='green')
plt.title('Total Sales by Region')
plt.xlabel('Region')
plt.ylabel('Total Sales')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



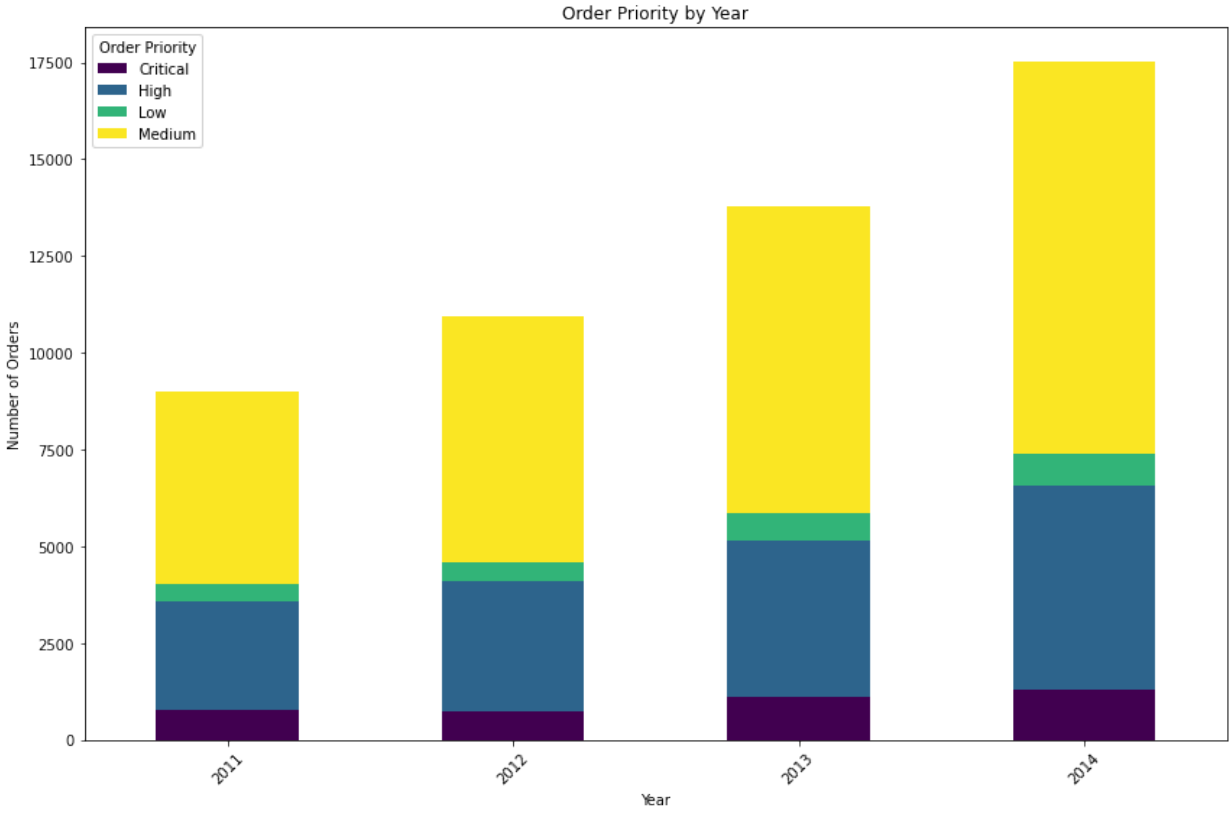
In [153…

```
# Aggregate total shipping cost by ship mode
ship_mode_cost = df.groupby('ship_mode')['shipping_cost'].sum().reset_index()

# Plot the data
plt.figure(figsize=(10, 6))
plt.bar(ship_mode_cost['ship_mode'], ship_mode_cost['shipping_cost'], color='orange')
plt.title('Total Shipping Cost by Ship Mode')
plt.xlabel('Ship Mode')
plt.ylabel('Total Shipping Cost')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



In [154…

```
# Aggregate the count of orders by year and order priority
order_priority_by_year = df.groupby(['year', 'order_priority']).size().unstack(fill_va

# Plot the data
order_priority_by_year.plot(kind='bar', stacked=True, figsize=(12, 8), colormap='viric
plt.title('Order Priority by Year')
plt.xlabel('Year')
plt.ylabel('Number of Orders')
plt.legend(title='Order Priority')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



In [ ]:

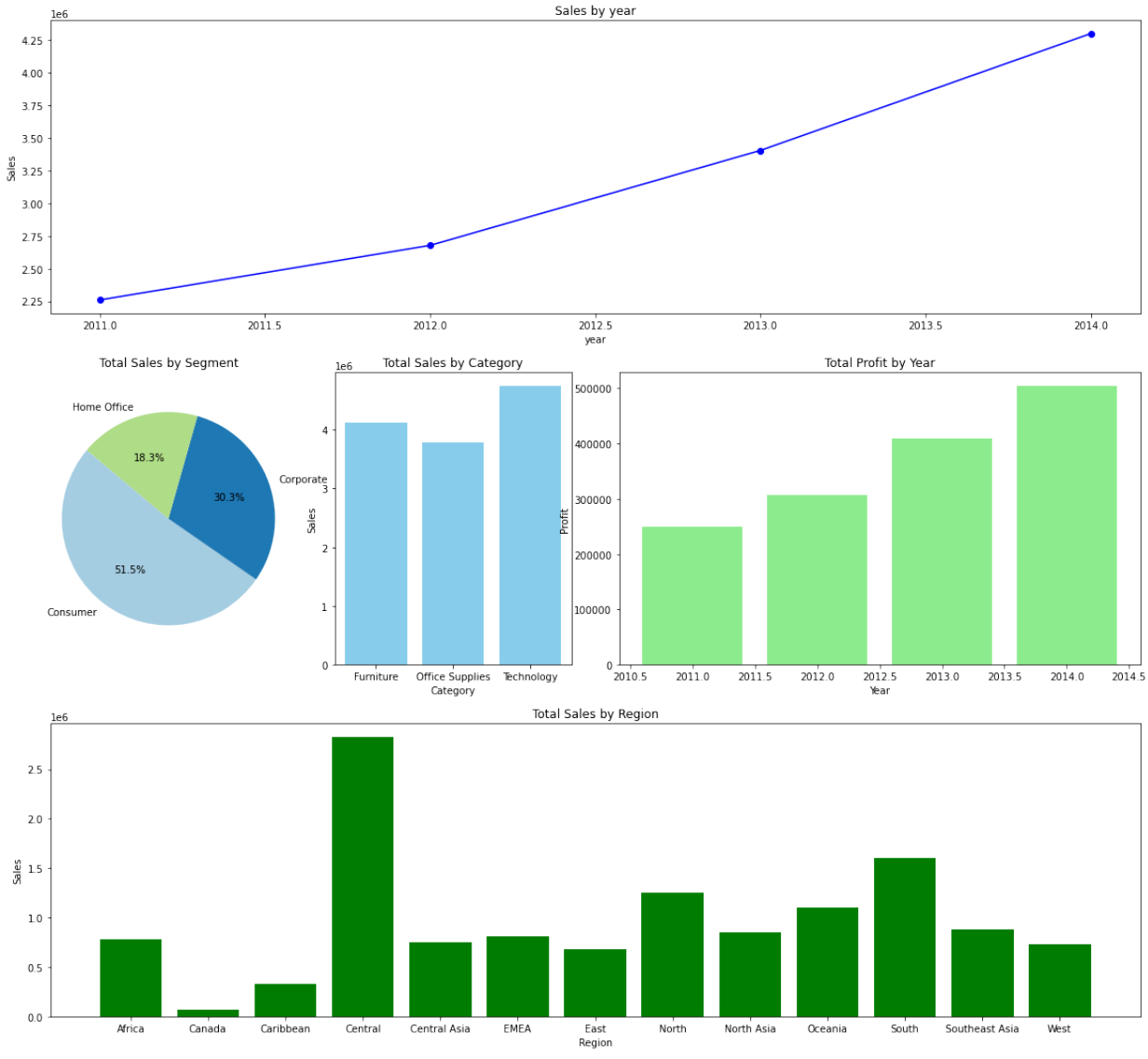
```
# CREATING DASHBOARD
```

In [156…

```
fig = plt.figure(figsize=(30,25))

ax = [None for _ in range(8)]

ax[0] = plt.subplot2grid((4,6), (0,0), colspan=4)
ax[1] = plt.subplot2grid((4,6), (1,0), colspan=1)
ax[2] = plt.subplot2grid((4 ,6), (1,1), colspan=1)
ax[3] = plt.subplot2grid((4,6), (1,2), colspan=2)
ax[4] = plt.subplot2grid((4,6), (2,3), colspan=3)
ax[5] = plt.subplot2grid((4,6), (2,0), colspan=4)



# to load content into the content
sales_by_month = df.groupby('year')['sales'].sum().reset_index()
ax[0].plot(sales_by_month['year'], sales_by_month['sales'], marker='o', color='b')
ax[0].set_title('Sales by year')
ax[0].set_xlabel('year')
```

```
ax[0].set_ylabel('Sales')


ax[1].pie(total_sales_by_segment['sales'], labels=total_sales_by_segment['segment'], a
ax[1].set_title('Total Sales by Segment')
ax[1].axis('equal')

ax[2].bar(total_sales_by_category['category'], total_sales_by_category['sales'], color
ax[2].set_title('Total Sales by Category')
ax[2].set_xlabel('Category')
ax[2].set_ylabel('Sales')

ax[3].bar(profit_by_year['year'], profit_by_year['profit'], color='lightgreen')
ax[3].set_title('Total Profit by Year')
ax[3].set_xlabel('Year')
ax[3].set_ylabel('Profit')

ax[5].bar(total_sales_by_region['region'], total_sales_by_region['sales'], color='gree
ax[5].set_title('Total Sales by Region')
ax[5].set_xlabel('Region')
ax[5].set_ylabel('Sales')
```

Out[156]: Text(0, 0.5, 'Sales')



In [ ]: