NAME : **B.RAMYA SREE**
REG.NO : **20MIS0065**

DATA ANALYTICS ASSESSMENT

JUPYTER NOTEBOOK TASK:

1)I have imported the necessary libraries in Jupyter notebook.
2)Loaded the given dataset and performed various visualizations.

LOADING THE DATA

In [1]:
```
#importing basic packages
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

In [2]:
```
#Loading the data
df = pd.read_csv('Global-Superstore - Global-Superstore.csv')
df.head()
```

Out[2]:

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	...	Product ID	Category	Sub-Category	Product Name
0	32298	CA-2012-124891	7/31/2012	7/31/2012	Same Day	RH-19495	Rick Hansen	Consumer	New York City	New York	...	TEC-AC-10003033	Technology	Accessories	Plantronics CS510 - Over-the-Head monaural Wir...
1	26341	IN-2013-77878	02-05-2013	02-07-2013	Second Class	JR-16210	Justin Ritter	Corporate	Wollongong	New South Wales	...	FUR-CH-10003950	Furniture	Chairs	Novimex Executive Leather Armchair, Black
2	25330	IN-2013-71249	10/17/2013	10/18/2013	First Class	CR-12730	Craig Reiter	Consumer	Brisbane	Queensland	...	TEC-PH-10004664	Technology	Phones	Nokia Smart Phone, with Caller ID
3	13524	ES-2013-1579342	1/28/2013	1/30/2013	First Class	KM-16375	Katherine Murray	Home Office	Berlin	Berlin	...	TEC-PH-10004583	Technology	Phones	Motorola Smart Phone, Cordless
4	47221	SG-2013-4320	11-05-2013	11-06-2013	Same Day	RH-9495	Rick Hansen	Consumer	Dakar	Dakar	...	TEC-SHA-10000501	Technology	Copiers	Sharp Wireless Fax, High-Speed

5 rows × 24 columns

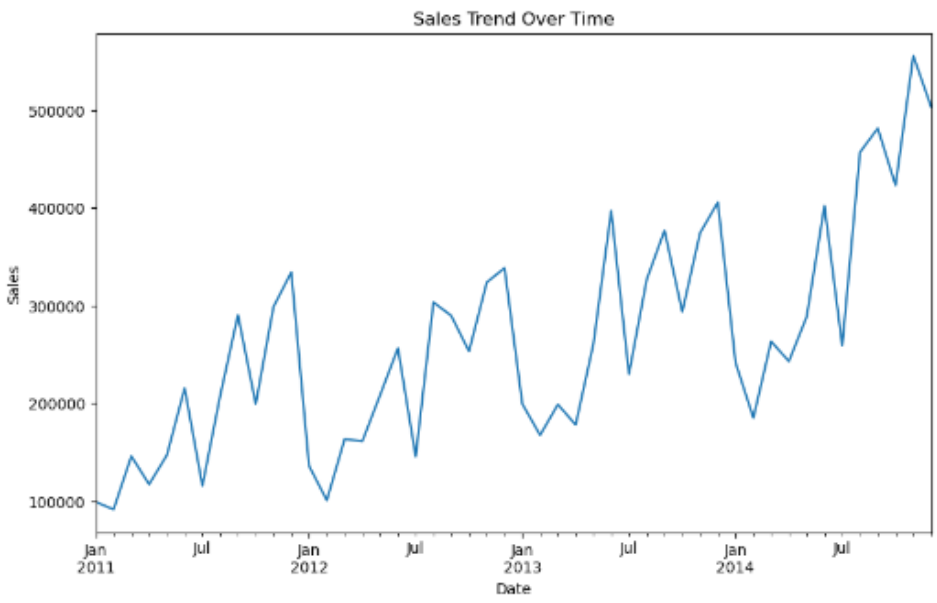
In [3]:
```
#Checking the shape of the dataset
df.shape
```

Out[3]: (51290, 24)

DATA VISUALISATION

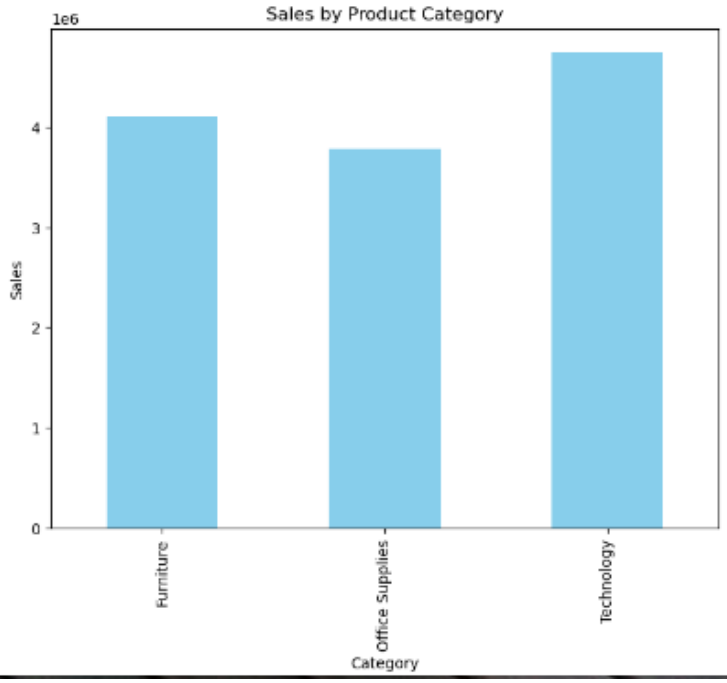
In [4]:
```
# 1. Sales Trend Over Time
plt.figure(figsize=(10, 6))
df['Order Date'] = pd.to_datetime(df['Order Date'])
sales_trend = df.groupby(df['Order Date'].dt.to_period('M')).sum()['Sales']
sales_trend.plot(kind='line')
plt.title('Sales Trend Over Time')
plt.xlabel('Date')
plt.ylabel('Sales')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\3096189954.py:4: FutureWarning: The default value of numeric_only in DataFrameG
roupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only c
olumns which should be valid for the function.
  sales_trend = df.groupby(df['Order Date'].dt.to_period('M')).sum()['Sales']
```



In [5]:
```
# 2. Sales by Product Category
plt.figure(figsize=(8, 6))
category_sales = df.groupby('Category').sum()['Sales']
category_sales.plot(kind='bar', color='skyblue')
plt.title('Sales by Product Category')
plt.xlabel('Category')
plt.ylabel('Sales')
plt.show()
```

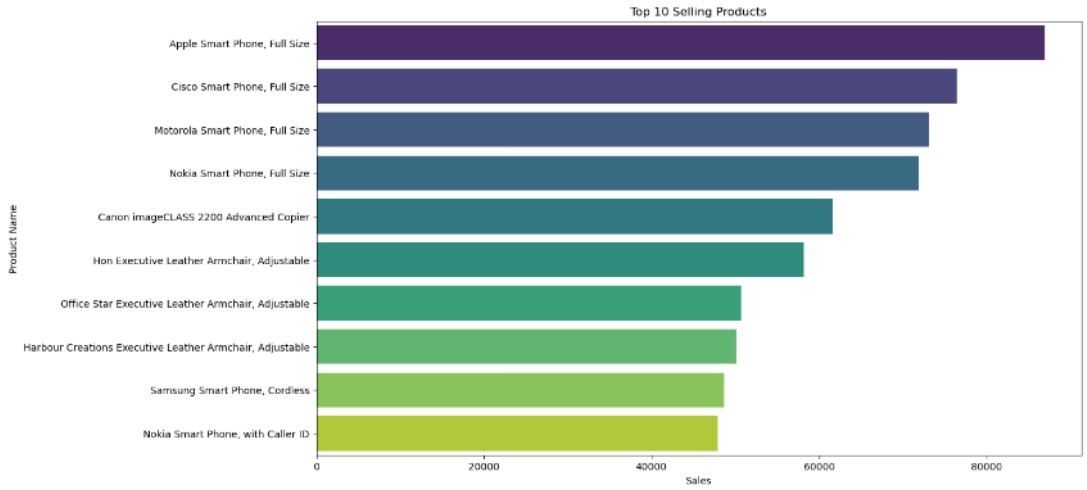
```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\483532061.py:3: FutureWarning: The default value of numeric_only in DataFrameGr
oupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only co
lumns which should be valid for the function.
  category_sales = df.groupby('Category').sum()['Sales']
```



In [6]:

```
# 3. Top Selling Products
top_products = df.groupby('Product Name').sum().sort_values(by='Sales', ascending=False).head(10)
plt.figure(figsize=(14, 8))
sns.barplot(x=top_products['Sales'], y=top_products.index, palette='viridis')
plt.title('Top 10 Selling Products')
plt.xlabel('Sales')
plt.ylabel('Product Name')
plt.show()
```

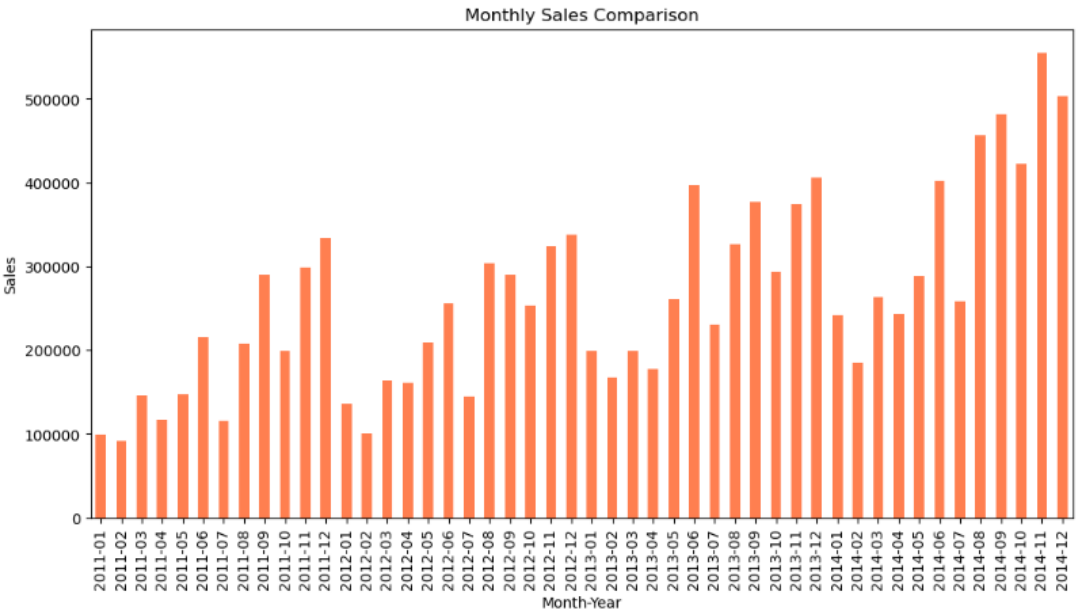
```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\4053753914.py:2: FutureWarning: The default value of numeric_only in DataFrameG
roupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only c
olumns which should be valid for the function.
  top_products = df.groupby('Product Name').sum().sort_values(by='Sales', ascending=False).head(10)
```



In [7]:

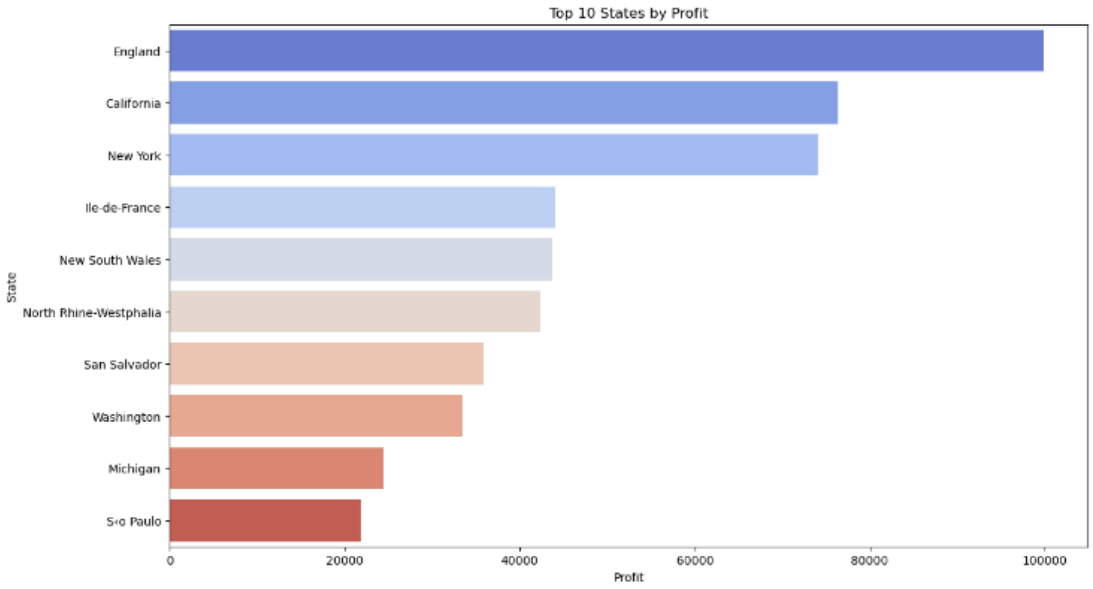
```
# 4. Monthly Sales Comparison
plt.figure(figsize=(12, 6))
df['Month-Year'] = df['Order Date'].dt.to_period('M')
monthly_sales = df.groupby('Month-Year').sum()['Sales']
monthly_sales.plot(kind='bar', color='coral')
plt.title('Monthly Sales Comparison')
plt.xlabel('Month-Year')
plt.ylabel('Sales')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\89757115.py:4: FutureWarning: The default value of numeric_only in DataFrameGro
upBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only col
umns which should be valid for the function.
  monthly_sales = df.groupby('Month-Year').sum()['Sales']
```



In [8]:
```
# 5. Profit by State
plt.figure(figsize=(14, 8))
state_profit = df.groupby('State').sum().sort_values(by='Profit', ascending=False).head(10)
sns.barplot(x=state_profit['Profit'], y=state_profit.index, palette='coolwarm')
plt.title('Top 10 States by Profit')
plt.xlabel('Profit')
plt.ylabel('State')
plt.show()
```

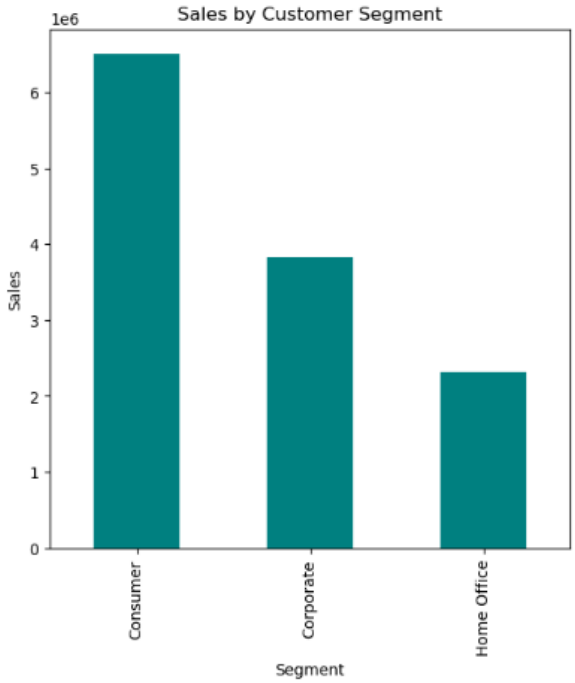
```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\2216427400.py:3: FutureWarning: The default value of numeric_only in DataFrameG
roupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only c
olumns which should be valid for the function.
  state_profit = df.groupby('State').sum().sort_values(by='Profit', ascending=False).head(10)
```



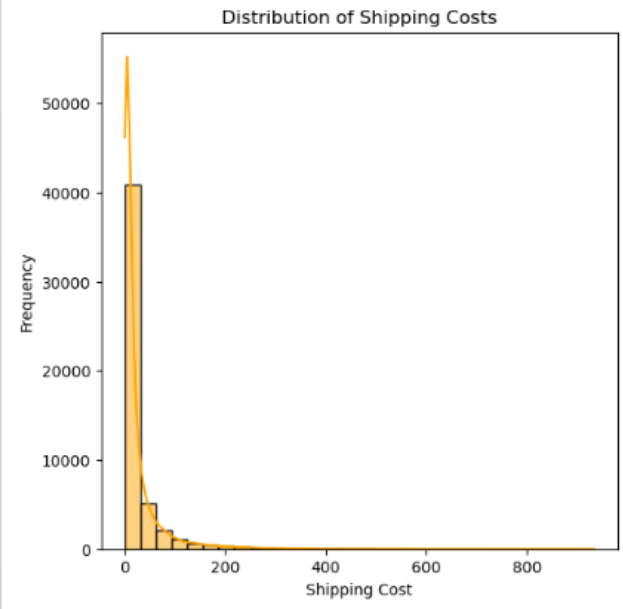
In [9]:
```
#Sales vs. Profit
plt.figure(figsize=(10, 6))
sns.scatterplot(data=df, x='Sales', y='Profit', hue='Category', palette='deep')
plt.title('Sales vs. Profit by Category')
plt.xlabel('Sales')
plt.ylabel('Profit')
plt.show()
```

In [10]:
```
plt.figure(figsize=(6, 6))
segment_sales = df.groupby('Segment').sum()['Sales']
segment_sales.plot(kind='bar', color='teal')
plt.title('Sales by Customer Segment')
plt.xlabel('Segment')
plt.ylabel('Sales')
plt.show()
```

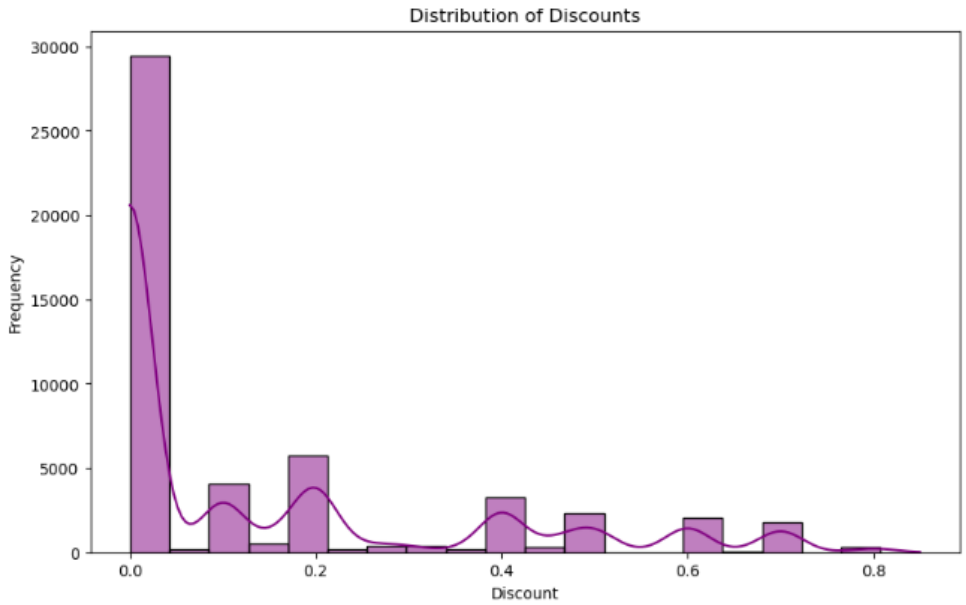
```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\2347368007.py:2: FutureWarning: The default value of numeric_only in DataFrameG
roupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only c
olumns which should be valid for the function.
  segment_sales = df.groupby('Segment').sum()['Sales']
```



In [11]:
```
#Distribution of shipping costs
plt.figure(figsize=(6, 6))
sns.histplot(df['Shipping Cost'], bins=30, kde=True, color='orange')
plt.title('Distribution of Shipping Costs')
plt.xlabel('Shipping Cost')
plt.ylabel('Frequency')
plt.show()
```

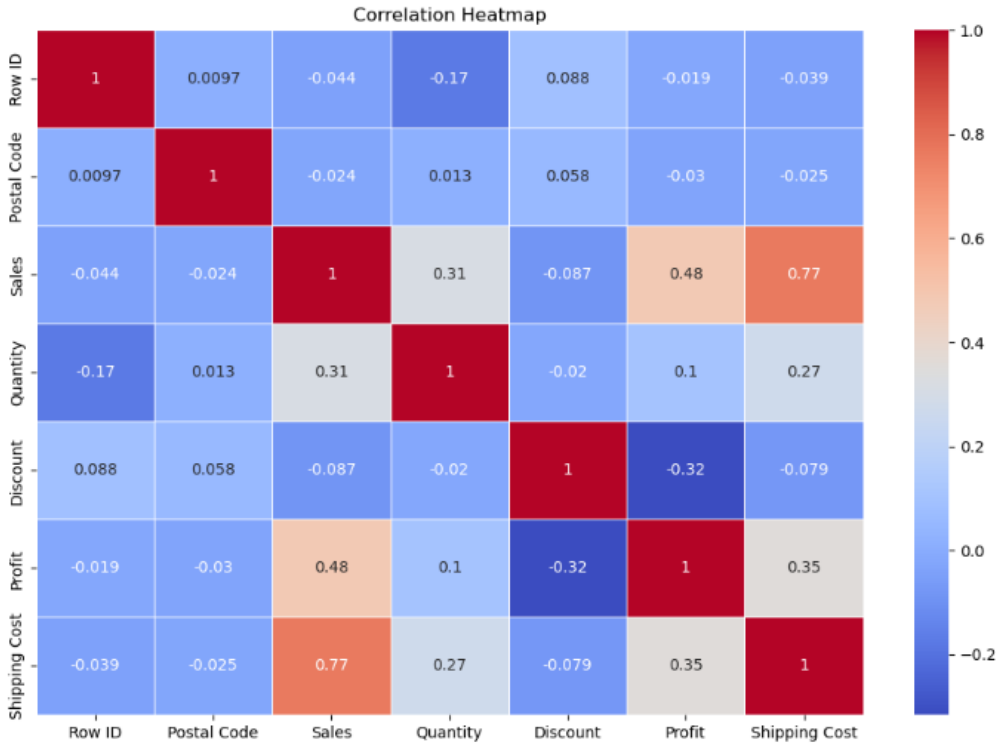


In [12]:
```
#Discounts given
plt.figure(figsize=(10, 6))
sns.histplot(df['Discount'], bins=20, kde=True, color='purple')
plt.title('Distribution of Discounts')
plt.xlabel('Discount')
plt.ylabel('Frequency')
plt.show()
```



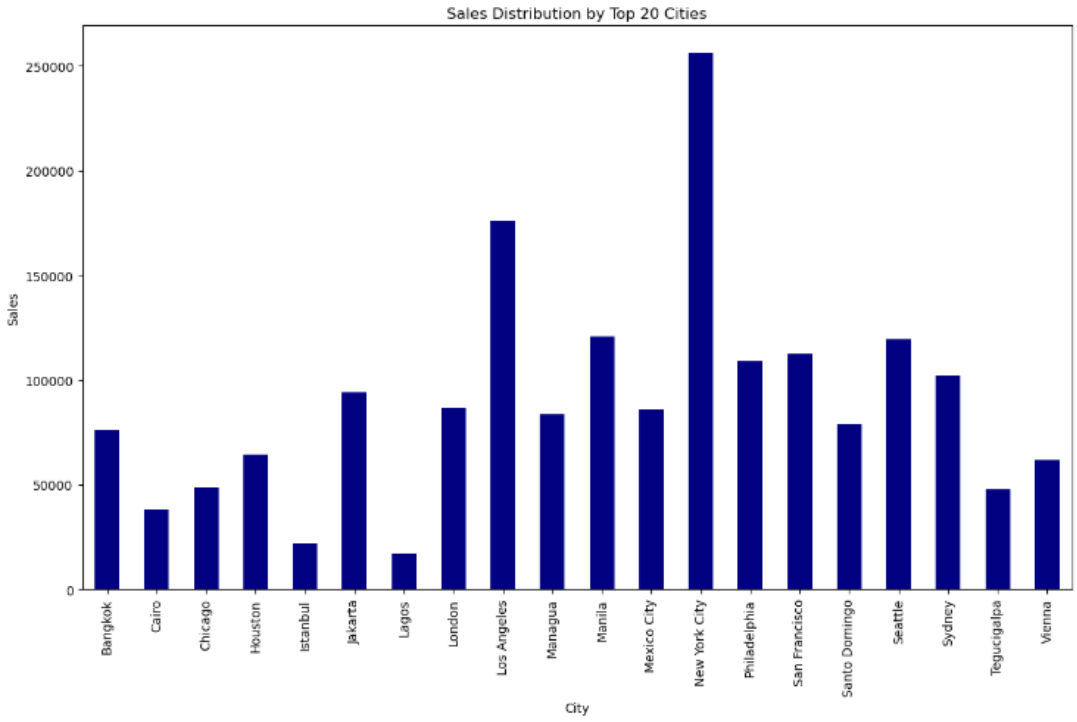
In [13]:
```
#correlation heat map
plt.figure(figsize=(12, 8))
correlation = df.corr()
sns.heatmap(correlation, annot=True, cmap='coolwarm', linewidths=0.5)
plt.title('Correlation Heatmap')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\408182514.py:3: FutureWarning: The default value of numeric_only in DataFrame.c
orr is deprecated. In a future version, it will default to False. Select only valid columns or specify the value of numeric_onl
y to silence this warning.
  correlation = df.corr()
```



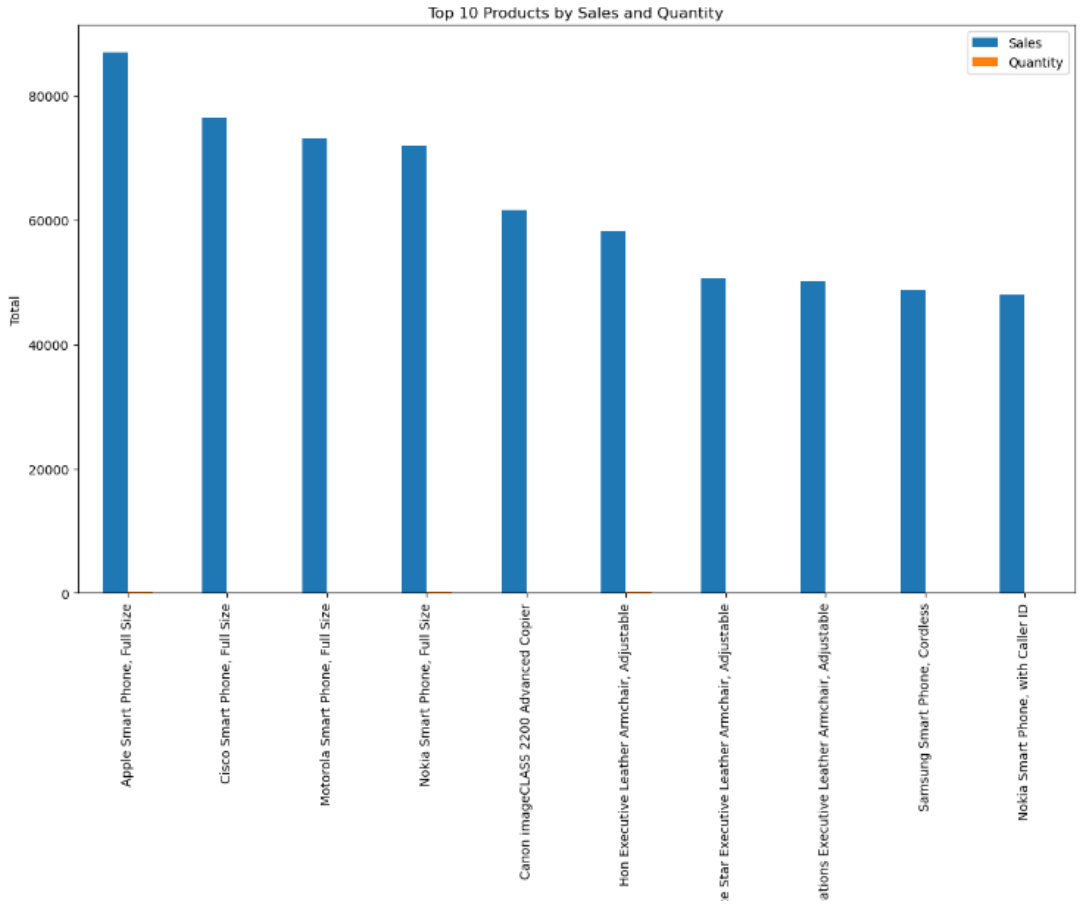
In [14]:
```
#Sales Distribution by City
top_cities = df['City'].value_counts().head(20).index
top_city_sales = df[df['City'].isin(top_cities)].groupby('City').sum()['Sales']
plt.figure(figsize=(14, 8))
top_city_sales.plot(kind='bar', color='navy')
plt.title('Sales Distribution by Top 20 Cities')
plt.xlabel('City')
plt.ylabel('Sales')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\102497122.py:3: FutureWarning: The default value of numeric_only in DataFrameGr
oupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only co
lumns which should be valid for the function.
  top_city_sales = df[df['City'].isin(top_cities)].groupby('City').sum()['Sales']
```



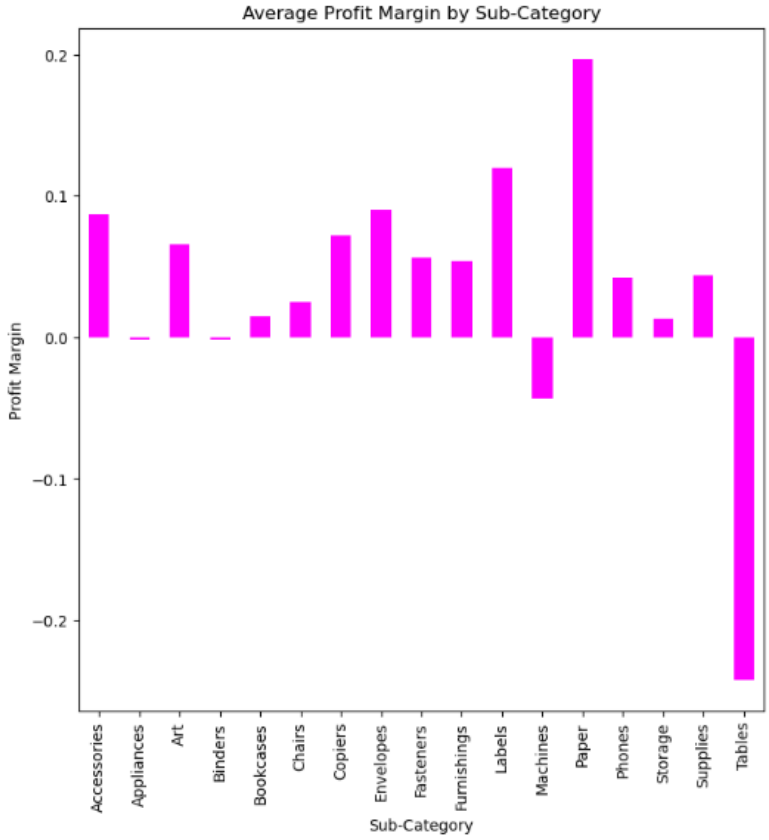
In [15]:
```
#sales and quantity by product
top_products_sales_quantity = df.groupby('Product Name').sum()[['Sales', 'Quantity']].sort_values(by='Sales', ascending=False).h
top_products_sales_quantity.plot(kind='bar', figsize=(14, 8))
plt.title('Top 10 Products by Sales and Quantity')
plt.xlabel('Product Name')
plt.ylabel('Total')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\201646630.py:2: FutureWarning: The default value of numeric_only in DataFrameGr
oupBy.sum is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only co
lumns which should be valid for the function.
  top_products_sales_quantity = df.groupby('Product Name').sum()[['Sales', 'Quantity']].sort_values(by='Sales', ascending=Fals
e).head(10)
```



In [16]:
```
#profit margin by subcategory
df['Profit Margin'] = df['Profit'] / df['Sales']
sub_category_profit_margin = df.groupby('Sub-Category').mean()['Profit Margin']
plt.figure(figsize=(8, 8))
sub_category_profit_margin.plot(kind='bar', color='magenta')
plt.title('Average Profit Margin by Sub-Category')
plt.xlabel('Sub-Category')
plt.ylabel('Profit Margin')
plt.show()
```

```
C:\Users\ramya\AppData\Local\Temp\ipykernel_560\576585600.py:3: FutureWarning: The default value of numeric_only in DataFrameGr
oupBy.mean is deprecated. In a future version, numeric_only will default to False. Either specify numeric_only or select only c
olumns which should be valid for the function.
  sub_category_profit_margin = df.groupby('Sub-Category').mean()['Profit Margin']
```



POWER BI TASK :

Performed Key Metrics:

- Display the following key metrics:
- Total Sales Revenue
- Sales by Product Category
- Top Selling Products
- Sales Trend Over Time
- Monthly Sales Comparison

Created a Dashboard