Importing necessary Libraries and loading datatset

In [ ]:

```
import numpy as np
import pandas as pd
```

In [ ]:

```
import kagglehub

# Download latest version
path = kagglehub.dataset_download("kyanyoga/sample-sales-data")

print("Path to dataset files:", path)
```

```
Using Colab cache for faster access to the 'sample-sales-data' dataset.
Path to dataset files: /kaggle/input/sample-sales-data
```

In [ ]:

```
df = pd.read_csv(path + "/sales_data_sample.csv", encoding='latin1')
```

In [ ]:

```
import os

# List files in the directory
print(os.listdir(path))
```

```
['sales_data_sample.csv']
```

Data Preprocessing

In [ ]:

```
df.head(2)
```

Out[ ]:

	ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	S
0	10107	30	95.70	2	2871.0	2/24/2003 0:00	S
1	10121	34	81.35	5	2765.9	5/7/2003 0:00	S

2 rows × 25 columns

In [ ]:

```
df.shape
```

Out[ ]:

```
(2823, 25)
```

In [ ]:

```
df.isnull().sum()
```

Out[ ]:

	0
ORDERNUMBER	0
QUANTITYORDERED	0
PRICEEACH	0
ORDERLINENUMBER	0
SALES	0
ORDERDATE	0
STATUS	0
QTR_ID	0
MONTH_ID	0
YEAR_ID	0
PRODUCTLINE	0
MSRP	0
PRODUCTCODE	0
CUSTOMERNAME	0
PHONE	0
ADDRESSLINE1	0
ADDRESSLINE2	2521
CITY	0
STATE	1486
POSTALCODE	76
COUNTRY	0
TERRITORY	1074
CONTACTLASTNAME	0
CONTACTFIRSTNAME	0
DEALSIZE	0

dtype: int64

In [ ]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2823 entries, 0 to 2822
Data columns (total 25 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   ORDERNUMBER       2823 non-null   int64  
 1   QUANTITYORDERED   2823 non-null   int64  
 2   PRICEEACH         2823 non-null   float64
 3   ORDERLINENUMBER   2823 non-null   int64  
 4   SALES             2823 non-null   float64
 5   ORDERDATE         2823 non-null   object 
 6   STATUS            2823 non-null   object 
 7   QTR_ID            2823 non-null   int64  
 8   MONTH_ID          2823 non-null   int64  
 9   YEAR_ID           2823 non-null   int64  
 10  PRODUCTLINE       2823 non-null   object 
 11  MSRP              2823 non-null   int64  
 12  PRODUCTCODE       2823 non-null   object 
 13  CUSTOMERNAME      2823 non-null   object 
 14  PHONE             2823 non-null   object 
 15  ADDRESSLINE1      2823 non-null   object 
 16  ADDRESSLINE2      302 non-null    object 
 17  CITY              2823 non-null   object 
 18  STATE             1337 non-null   object 
 19  POSTALCODE        2747 non-null   object 
 20  COUNTRY           2823 non-null   object 
 21  TERRITORY         1749 non-null   object 
 22  CONTACTLASTNAME   2823 non-null   object 
 23  CONTACTFIRSTNAME  2823 non-null   object 
 24  DEALSIZE          2823 non-null   object 
dtypes: float64(2), int64(7), object(16)
memory usage: 551.5+ KB
```

In [ ]:
```
df.drop(['ADDRESSLINE2', 'STATE', 'POSTALCODE', 'PHONE'], axis=1, inplace=True)
```

In [ ]:
```
df.head(2)
```

Out[ ]:

	ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	S
0	10107	30	95.70	2	2871.0	2/24/2003 0:00	S
1	10121	34	81.35	5	2765.9	5/7/2003 0:00	S

2 rows × 21 columns

In [ ]:
```
df.dropna(inplace=True)
```

In [ ]:
```
df.drop(['CUSTOMERNAME', 'ADDRESSLINE1', 'CITY', 'COUNTRY', 'TERRITORY', 'CONTACTL
```

In [ ]:
```
df.head(2)
```

Out[ ]:

	QUANTITYORDERED	PRICEEACH	SALES	ORDERDATE	STATUS	QTR_ID	MONTH_ID	YEAR_ID
1	34	81.35	2765.90	5/7/2003 0:00	Shipped	2	5	2003
2	41	94.74	3884.34	7/1/2003 0:00	Shipped	3	7	2003

In [ ]:

```
import seaborn as sns
import matplotlib.pyplot as plt
```

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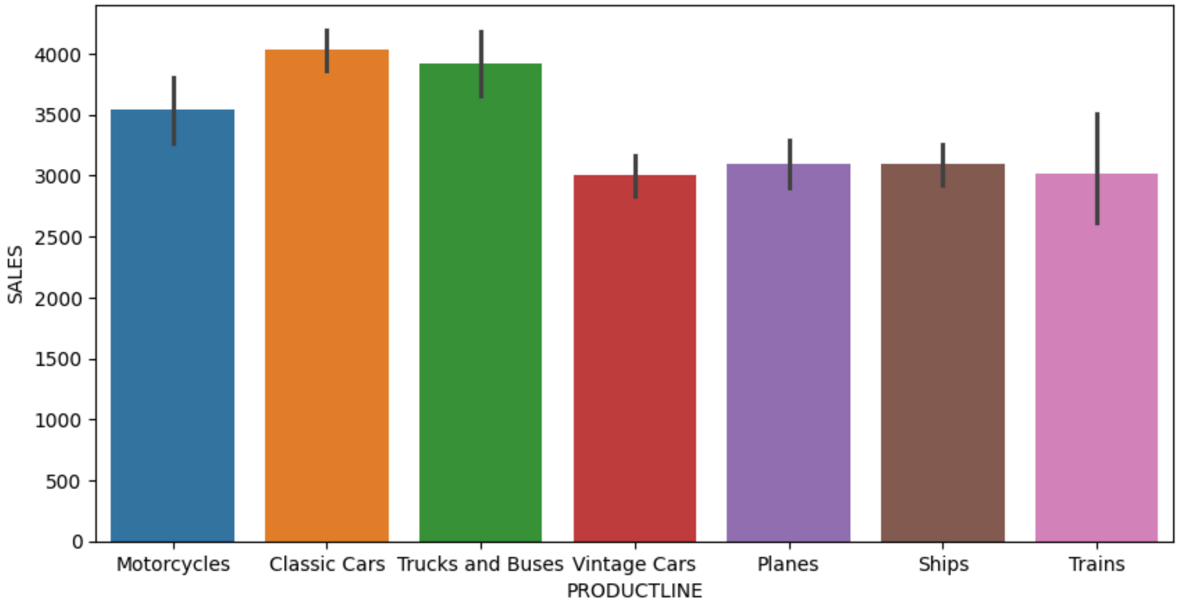
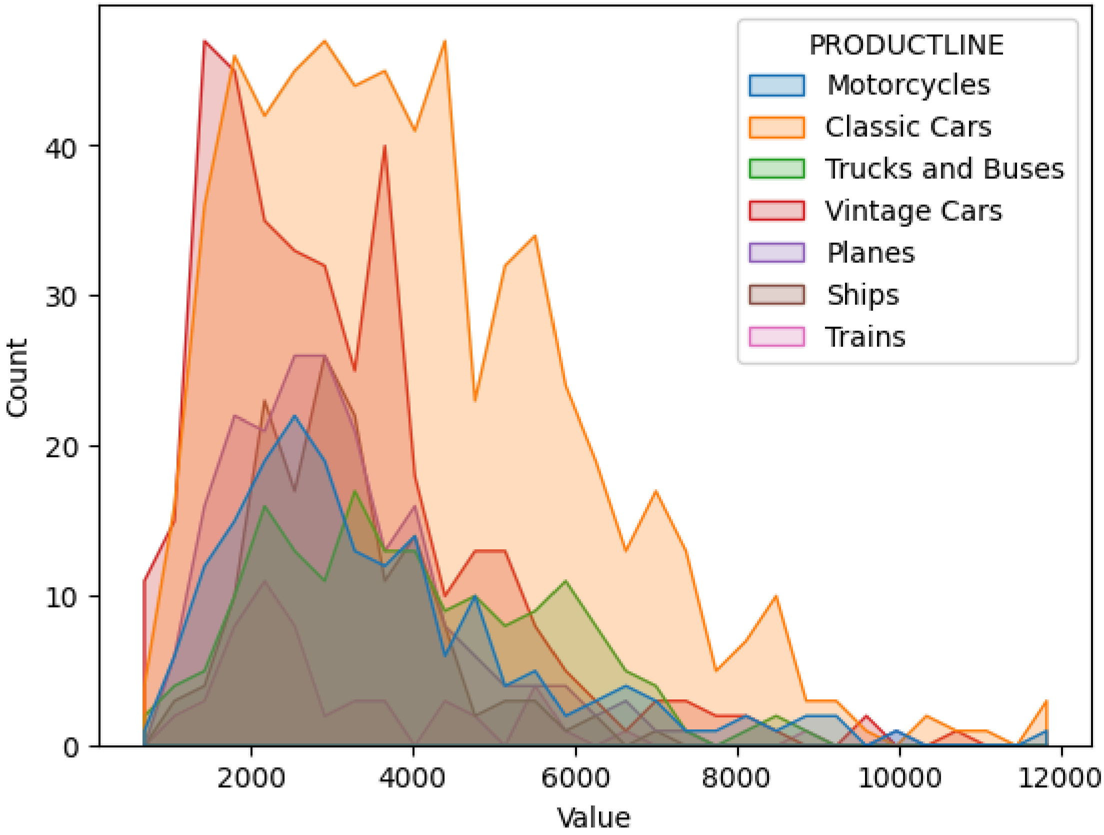
In [ ]:

```
plt.figure(figsize=(10,5))
sns.barplot(x=df['PRODUCTLINE'],y=df['SALES'] ,hue=df['PRODUCTLINE'])
plt.show()
```



In [ ]:

```
df_melted = df.melt(id_vars=['PRODUCTLINE'], value_vars=['SALES'], var_name='Variab
sns.histplot(data=df_melted, x='Value', hue='PRODUCTLINE', element='poly')
plt.show()
```



In [ ]:
```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
```

In [ ]:
```
Categorical = df.select_dtypes(include='object')
```

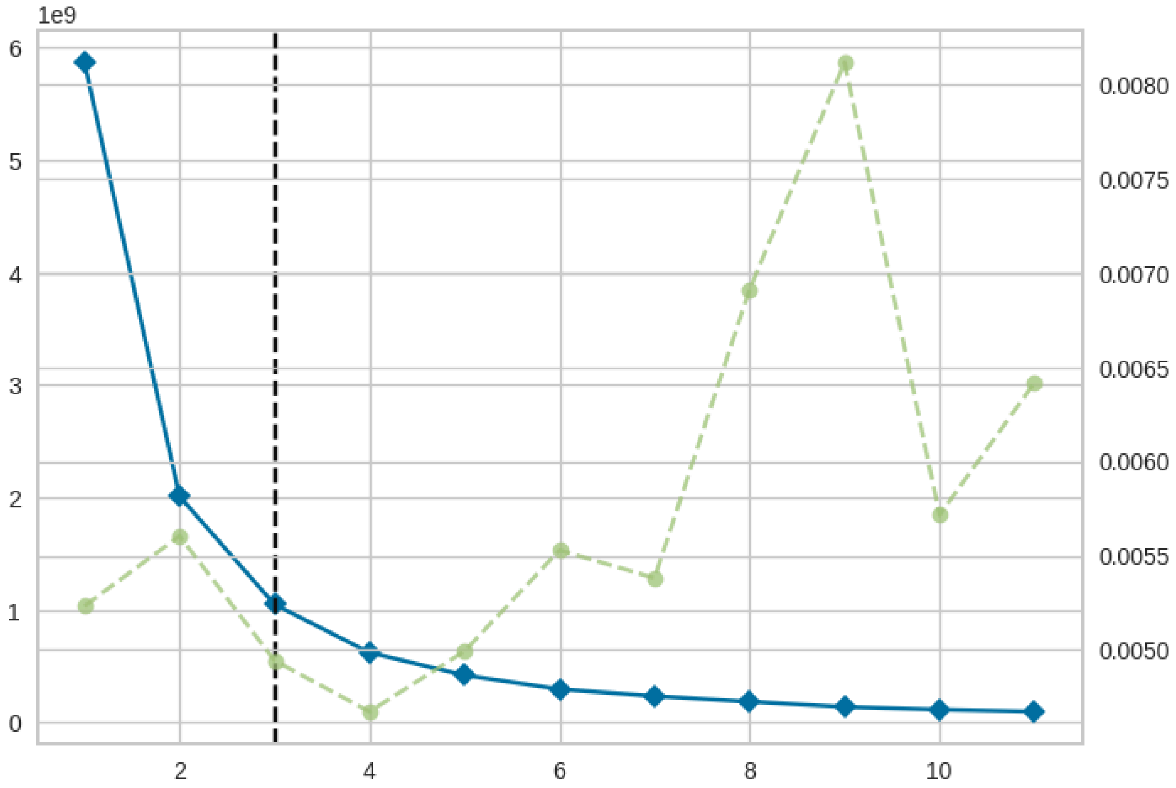
In [ ]:
```
for i in Categorical:
    df[i] = le.fit_transform(df[i])
```

In [ ]:
```
X=df[['SALES','QUANTITYORDERED']]
```

In [ ]:
```
from yellowbrick.cluster import KElbowVisualizer
from sklearn.cluster import KMeans
```

Selection of K value

In [ ]:
```
model = KMeans()
visualizer = KElbowVisualizer(model, k=(1,12)).fit(X)
```



K = 3

In [ ]:

```
KMEANS = KMeans(n_clusters=3,init='k-means++',random_state=42)
```

Model Training and visualizing the results

In [ ]:

```
KMEANS.fit(X)
KMEANS.labels_
```

Out[ ]:

```
array([0, 2, 0, ..., 2, 2, 0], dtype=int32)
```

In [ ]:

```
from collections import Counter
```

In [ ]:

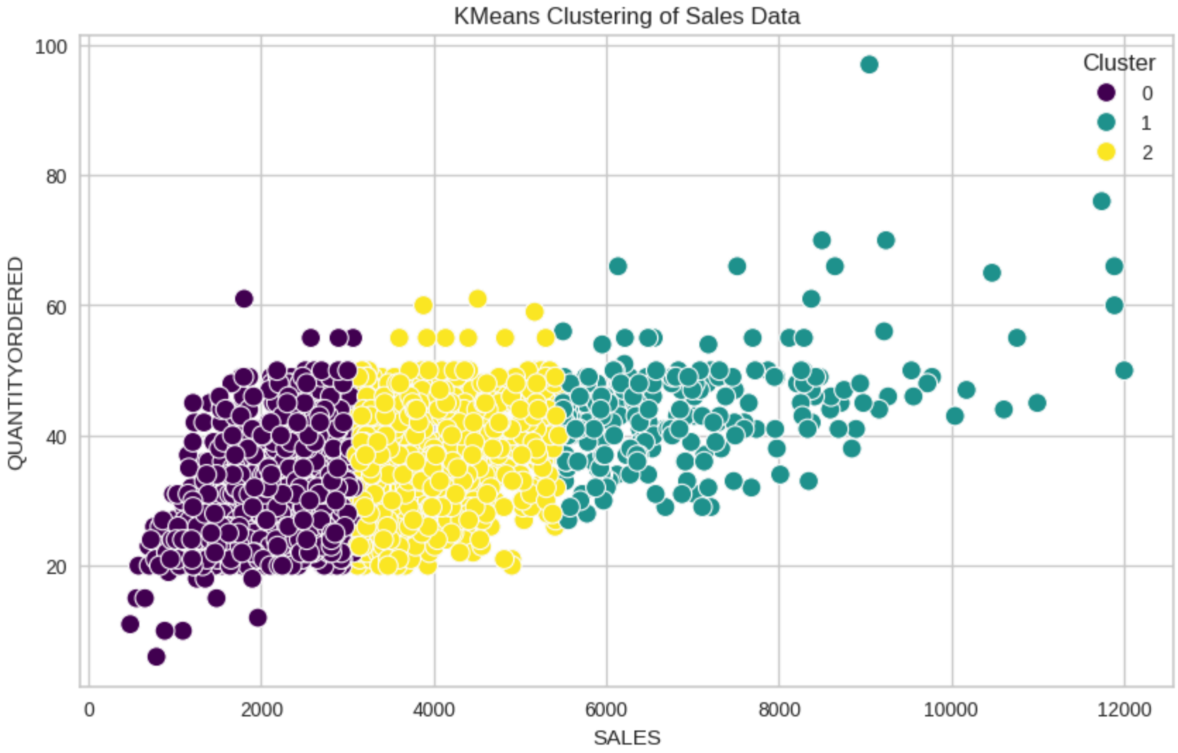
```
Counter(KMEANS.labels_)
```

Out[ ]:

```
Counter({np.int32(0): 843, np.int32(2): 652, np.int32(1): 254})
```

In [ ]:

```
plt.figure(figsize=(10, 6))
sns.scatterplot(x=X['SALES'], y=X['QUANTITYORDERED'], hue=KMEANS.labels_, palette='
plt.title('KMeans Clustering of Sales Data')
plt.xlabel('SALES')
plt.ylabel('QUANTITYORDERED')
plt.legend(title='Cluster')
plt.grid(True)
plt.show()
```


KMeans Clustering of Sales Data
QUANTITYORDERED
100
80
60
40
20
0
2000
4000
6000
8000
10000
12000
SALES
Cluster
0
1
2