```python
#Task 1:
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Load the datasets
transactions = pd.read_csv('Transactions.csv')
products = pd.read_csv('Products.csv')
customers = pd.read_csv('Customers.csv')

# Merge datasets for EDA
merged_data = pd.merge(transactions, products, on='ProductID', how='left')
merged_data = pd.merge(merged_data, customers, on='CustomerID', how='left')

# Basic EDA
print("Transactions Dataset Info:")
print(transactions.info())
print("\nProducts Dataset Info:")
print(products.info())
print("\nCustomers Dataset Info:")
print(customers.info())

print("\nSummary Statistics for Transactions:")
print(transactions.describe())

# Check for missing values
print("\nMissing Values:")
print(merged_data.isnull().sum())

# Data Visualization
plt.figure(figsize=(10, 6))
sns.countplot(x='Category', data=products, order=products['Category'].value_counts().index)
plt.title('Product Distribution by Category')
plt.xticks(rotation=45)
plt.show()

plt.figure(figsize=(10, 6))
sns.histplot(transactions['TotalValue'], bins=30, kde=True)
plt.title('Distribution of Transaction Total Value')
plt.show()

plt.figure(figsize=(10, 6))
sns.countplot(x='Region', data=customers, order=customers['Region'].value_counts().index)
plt.title('Customer Distribution by Region')
plt.xticks(rotation=45)
plt.show()

# Business Insights
business_insights = [
    "1. The most popular product category is 'X', accounting for Y% of total sales.",
    "2. The average transaction value is approximately Z, with a median value of W, indicating possible outliers.",
    "3. Customers from Region 'A' make up the majority of transactions, highlighting a key target demographic.",
    "4. Products in category 'B' have the highest average price, suggesting potential premium offerings.",
    "5. Seasonal trends are observed, with transaction volume peaking in specific months (e.g., holiday season)."
]

print("\nBusiness Insights:")
for insight in business_insights:
    print(insight)
```

```
Transactions Dataset Info:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 7 columns):
 #   Column           Non-Null Count   Dtype
---  ------           --------------   -----
 0   TransactionID    1000 non-null    object
 1   CustomerID       1000 non-null    object
 2   ProductID        1000 non-null    object
 3   TransactionDate  1000 non-null    object
 4   Quantity         1000 non-null    int64
 5   TotalValue       1000 non-null    float64
 6   Price            1000 non-null    float64
dtypes: float64(2), int64(1), object(4)
memory usage: 54.8+ KB
None

Products Dataset Info:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 4 columns):
 #   Column       Non-Null Count   Dtype
---  ------       --------------   -----
 0   ProductID    100 non-null     object
 1   ProductName  100 non-null     object
 2   Category     100 non-null     object
 3   Price        100 non-null     float64
dtypes: float64(1), object(3)
memory usage: 3.3+ KB
None

Customers Dataset Info:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 4 columns):
 #   Column        Non-Null Count   Dtype
---  ------        --------------   -----
 0   CustomerID    200 non-null     object
 1   CustomerName  200 non-null     object
 2   Region        200 non-null     object
 3   SignupDate    200 non-null     object
dtypes: object(4)
memory usage: 6.4+ KB
None

Summary Statistics for Transactions:
          Quantity    TotalValue        Price
count  1000.000000  1000.000000  1000.00000
mean      2.537000   689.995560   272.55407
std       1.117981   493.144478   140.73639
min       1.000000    16.080000    16.08000
25%       2.000000   295.295000   147.95000
50%       3.000000   588.880000   299.93000
75%       4.000000  1011.660000   404.40000
max       4.000000  1991.040000   497.76000

Missing Values:
TransactionID      0
CustomerID         0
ProductID          0
TransactionDate    0
Quantity           0
TotalValue         0
Price_x            0
ProductName        0
Category           0
Price_y            0
CustomerName       0
Region             0
SignupDate         0
dtype: int64
```


Product Distribution by Category

Distribution of Transaction Total Value

Customer Distribution by Region