EDA CODE:

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import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

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

# Convert date columns to datetime
customers['SignupDate'] = pd.to_datetime(customers['SignupDate'])
transactions['TransactionDate'] = pd.to_datetime(transactions['TransactionDate'])

# Merge datasets
merged_data = transactions.merge(customers, on='CustomerID').merge(products, on='ProductID')

# 1. Customer Distribution by Region
plt.figure(figsize=(8, 6))
region_distribution = customers['Region'].value_counts()
sns.barplot(x=region_distribution.index, y=region_distribution.values, palette="viridis")
plt.title("Customer Distribution by Region", fontsize=14)
plt.xlabel("Region", fontsize=12)
plt.ylabel("Number of Customers", fontsize=12)
plt.xticks(rotation=45)
plt.show()

# 2. Top Product Categories by Count
plt.figure(figsize=(8, 6))
category_distribution = products['Category'].value_counts()
sns.barplot(x=category_distribution.index, y=category_distribution.values, palette="coolwarm")
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plt.title("Product Categories by Count", fontsize=14)
plt.xlabel("Category", fontsize=12)
plt.ylabel("Number of Products", fontsize=12)
plt.xticks(rotation=45)
plt.show()

# 3. Monthly Revenue Trends
merged_data['YearMonth'] = merged_data['TransactionDate'].dt.to_period('M').astype(str)
monthly_revenue = merged_data.groupby('YearMonth')['TotalValue'].sum().reset_index()
plt.figure(figsize=(12, 6))
sns.lineplot(data=monthly_revenue, x='YearMonth', y='TotalValue', marker='o', color="orange")
plt.title("Monthly Revenue Over Time", fontsize=14)
plt.xlabel("Month", fontsize=12)
plt.ylabel("Total Revenue (USD)", fontsize=12)
plt.xticks(rotation=45)
plt.show()

# 4. Top 10 Products by Revenue
top_products = merged_data.groupby('ProductName')['TotalValue'].sum().nlargest(10).reset_index()
plt.figure(figsize=(10, 6))
sns.barplot(data=top_products, x='TotalValue', y='ProductName', palette="Blues_r")
plt.title("Top 10 Products by Revenue", fontsize=14)
plt.xlabel("Revenue (USD)", fontsize=12)
plt.ylabel("Product Name", fontsize=12)
plt.show()

# 5. Revenue by Region
region_revenue = merged_data.groupby('Region')['TotalValue'].sum().reset_index()
plt.figure(figsize=(8, 6))
sns.barplot(data=region_revenue, x='TotalValue', y='Region', palette="Greens_r")
plt.title("Revenue by Region", fontsize=14)
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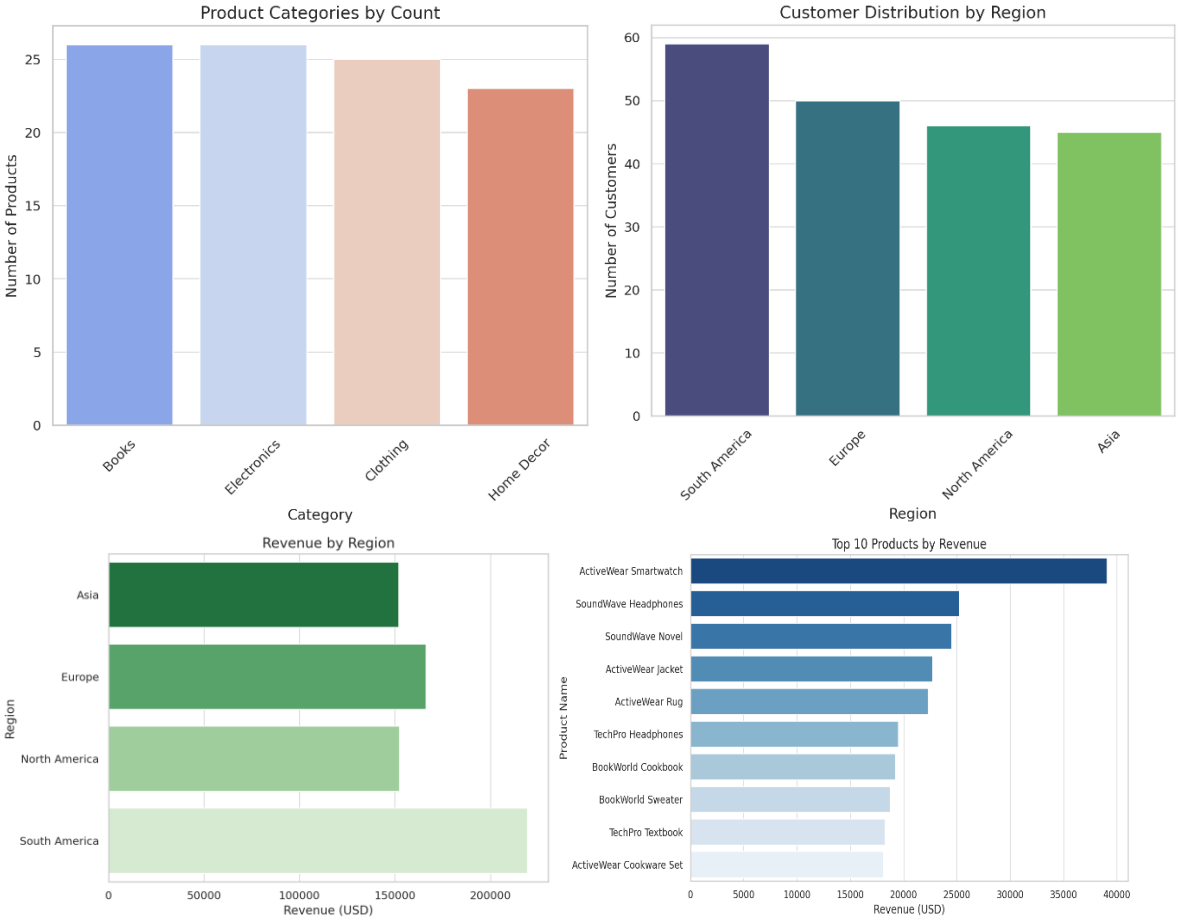
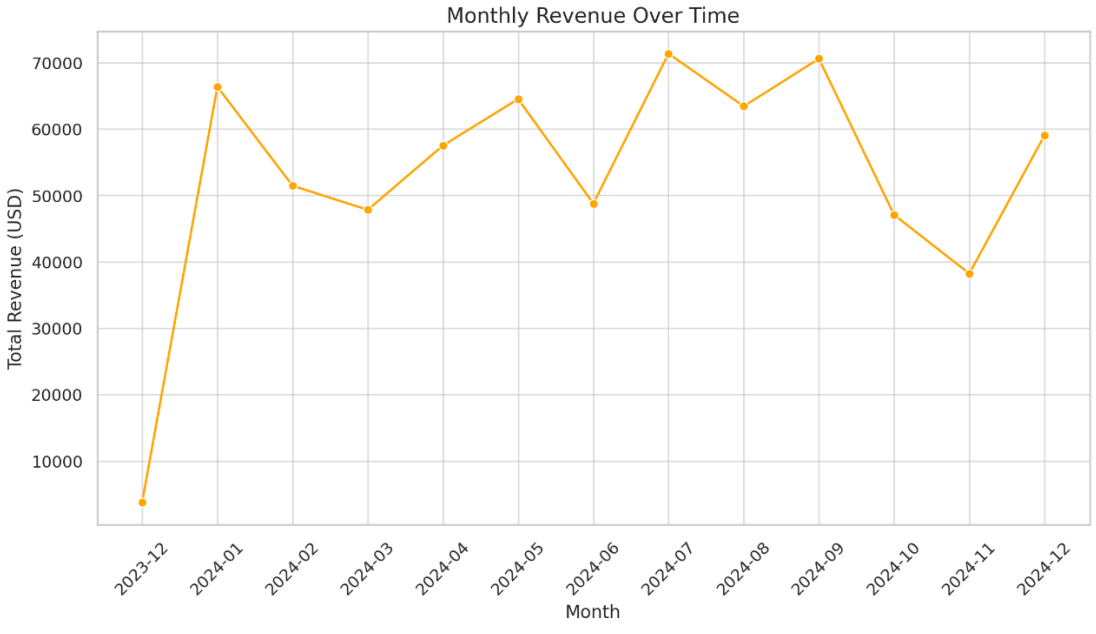
plt.xlabel("Revenue (USD)", fontsize=12)

plt.ylabel("Region", fontsize=12)

plt.show()

Output:





The EDA script has been provided, which includes visualizations for customer distribution, product categories, monthly revenue trends, top products by revenue, and regional revenue contributions.