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


# Load datasets
customers = pd.read_csv("/content/Customers.csv")
products = pd.read_csv("/content/Products.csv")
transactions = pd.read_csv("/content/Transactions.csv")
```

EDA (Exploratory Data Analysis)

Overview of datasets

```
# Overview of data
print(customers.info())
print(products.info())
print(transactions.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
<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
<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
```

```
# Display basic statistics
print(customers.describe())
print(products.describe())
print(transactions.describe())
```

```
       CustomerID      CustomerName         Region  SignupDate
count         200               200            200         200
unique        200               200              4         179
top         C0001  Lawrence Carroll  South America  2024-11-11
freq            1                 1             59           3
             Price
count  100.000000
mean   267.551700
std    143.219383
min     16.080000
25%    147.767500
```

```
50%    292.875000
75%    397.090000
max    497.760000
          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
```

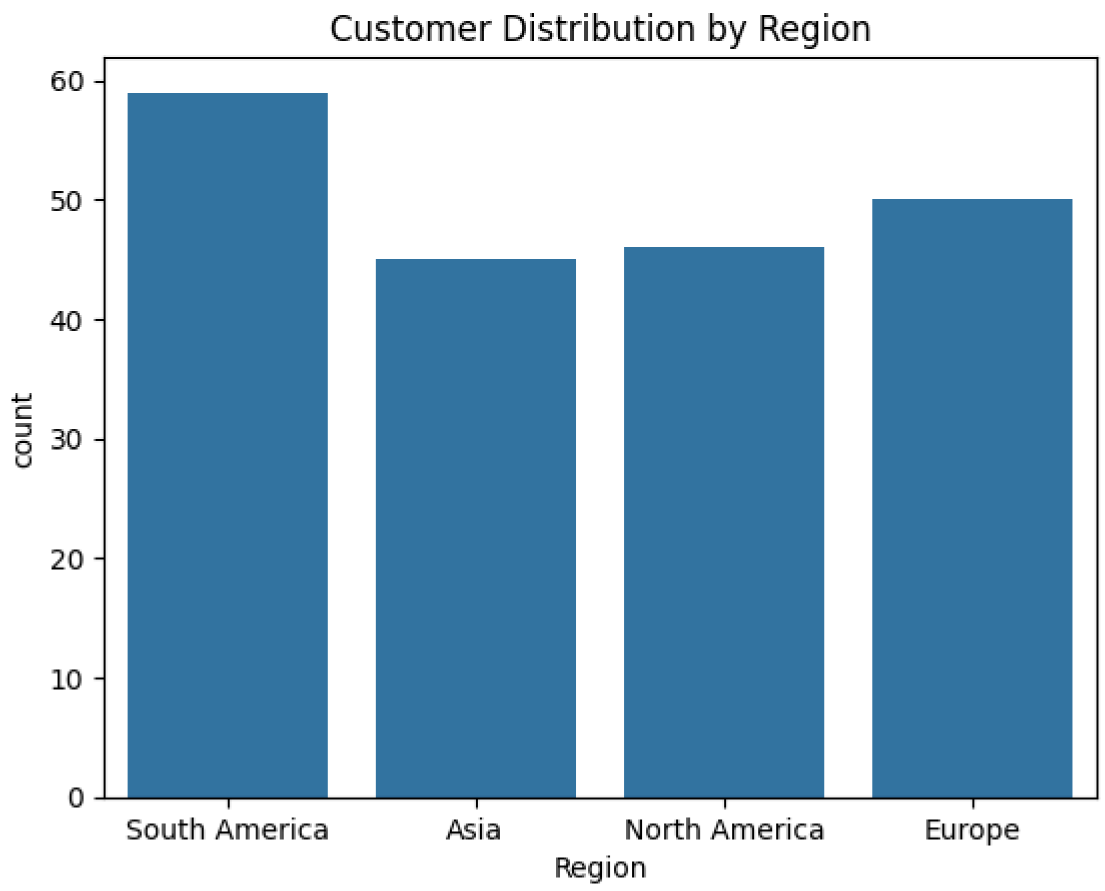
Missing values checking

```
# Check for missing values
print(customers.isnull().sum())
print(products.isnull().sum())
print(transactions.isnull().sum())
```

```
CustomerID      0
CustomerName    0
Region          0
SignupDate      0
dtype: int64
ProductID      0
ProductName    0
Category       0
Price          0
dtype: int64
TransactionID      0
CustomerID         0
ProductID          0
TransactionDate    0
Quantity           0
TotalValue         0
Price              0
dtype: int64
```

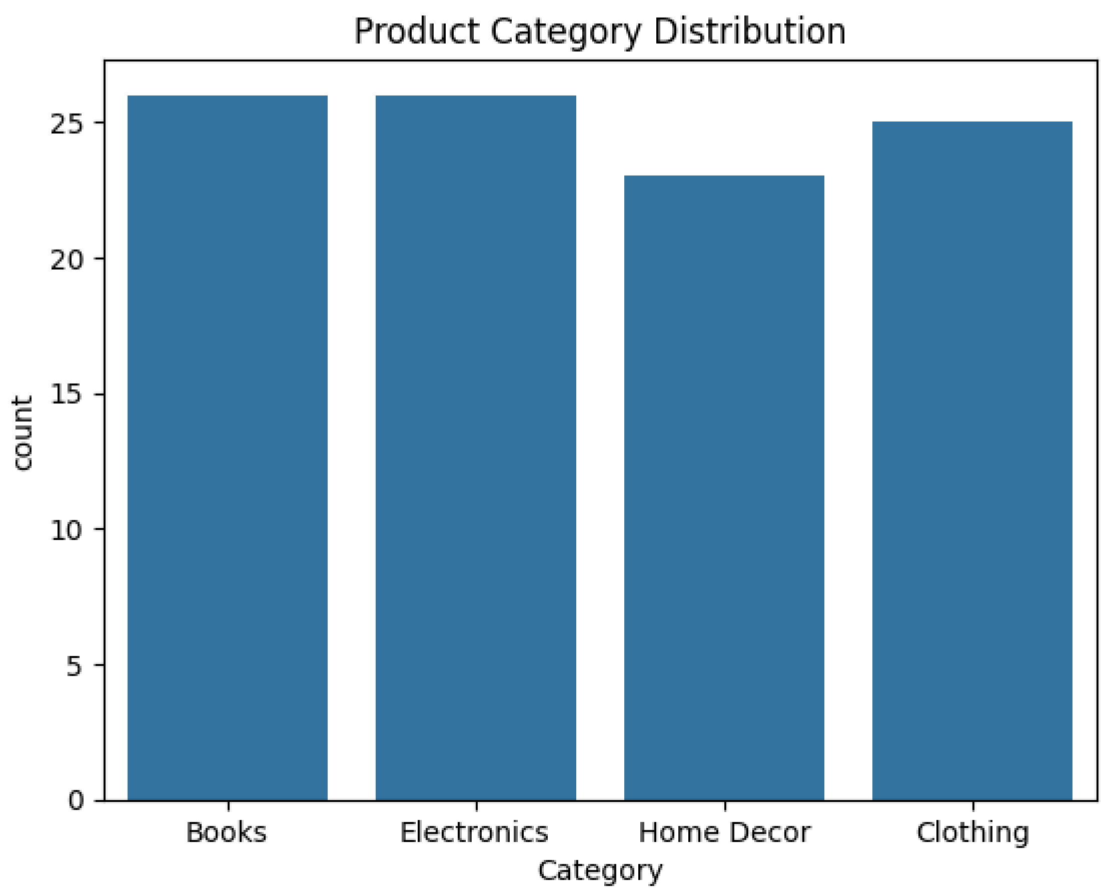
Visualization

```
# Distribution of regions
sns.countplot(data=customers, x="Region")
plt.title("Customer Distribution by Region")
plt.show()
```

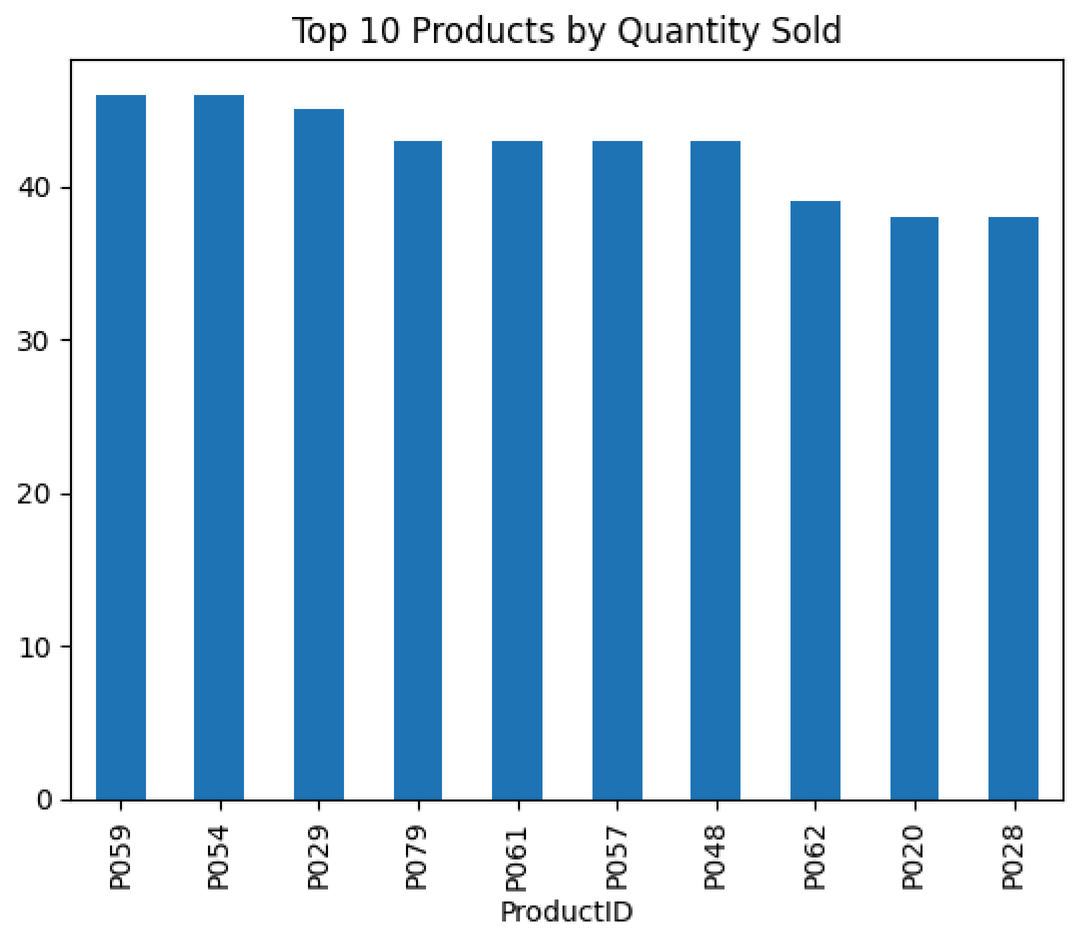


```
# Product category distribution
sns.countplot(data=products, x="Category")
```

```
plt.title("Product Category Distribution")
plt.show()
```



```
# Top products by transaction quantity
top_products = transactions.groupby("ProductID")["Quantity"].sum().sort_values(ascending=False).head(10)
top_products.plot(kind="bar", title="Top 10 Products by Quantity Sold")
plt.show()
```



1. The majority of customers are from the "Asia" region, indicating a strong presence in that market.
2. Products in the "Electronics" category have the highest sales, suggesting their popularity.
3. A small number of products contribute to the majority of the sales (Pareto principle).

Start coding or generate with AI.