Exploratory Data Analysis (EDA) and Business Insights

Loading the DataBase:

```python
import pandas as pd

customers = pd.read_csv('Customers.csv')
products = pd.read_csv('Products.csv')
transactions = pd.read_csv('Transactions.csv')

# Display basic information about each dataset
customers_info = customers.info()
products_info = products.info()
transactions_info = transactions.info()

# Display the first few rows of each dataset
customers_head = customers.head()
products_head = products.head()
transactions_head = transactions.head()

customers_info, customers_head, products_info, products_head, transactions_info, transactions_head
```

Checking for missing values:

```python
missing_values = {
    "Customers": customers.isnull().sum(),
    "Products": products.isnull().sum(),
    "Transactions": transactions.isnull().sum()
}

duplicates = {
    "Customers": customers.duplicated().sum(),
    "Products": products.duplicated().sum(),
    "Transactions": transactions.duplicated().sum()
}

# Analyze regional distribution of customers
regional_distribution = customers['Region'].value_counts()

# Analyze product category distribution
category_distribution = products['Category'].value_counts()

# Analyze transaction trends
transactions['TransactionDate'] = pd.to_datetime(transactions['TransactionDate'])
transactions['TransactionMonth'] = transactions['TransactionDate'].dt.to_period('M')
monthly_revenue = transactions.groupby('TransactionMonth')['TotalValue'].sum()
```

```
# Identify top customers by total spending
top_customers =
transactions.groupby('CustomerID')['TotalValue'].sum().sort_values(ascending=False).head(10)

# Identify most popular products by quantity sold
popular_products = transactions.groupby('ProductID')['Quantity'].sum().sort_values(ascending=False).head(10)

missing_values, duplicates, regional_distribution, category_distribution, monthly_revenue.head(),
top_customers, popular_products
```

Results from the initial EDA:

1. Missing Values and duplicates:
- **Missing Values**: None across the data sets
- **Duplicates**: None across the data sets

2. Regional Distribution of Customers:
- **South America**: 59 customers
- **Europe:** 50 customers
- **North America:** 46 customers
- **Asia:** 45 customers

3. Product Category Distribution:
- **Books:** 26 products
- **Electronics:** 26 products
- **Clothing:** 25 products
- **Home Decor:** 23 products

4.Monthly Revenue Trends (Top 5 Months):
- **December 2023:** $3,769.52
- **January 2024:** $66,376.39
- **February 2024:** $51,459.27
- **March 2024:** $47,828.73
- **April 2024:** $57,519.06

5. Top 10 Customers by Total Spending
- **C0141:** $10,673.87
- **C0054:** $8,040.39
- **C0065:** $7,663.70
- **C0156:** $7,634.45
- **C0082:** $7,572.91