

Exploratory Data Analysis (EDA) and Business Insights eCommerce Transactions Dataset

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Introduction

- Provided with an eCommerce Transactions dataset consisting of three files: Customers.csv, Products.csv, and Transactions.csv.
- Perform exploratory data analysis (EDA), build predictive models, and derive actionable insights.

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Sample Merged Dataset

	TransactionID	CustomerID	ProductID	TransactionDate	Quantity	TotalValue	...	CustomerName	Region	SignupDate	ProductName	Category	Price_y
0	T00001	C0199	P067	2024-08-25 12:38:23	1	300.68	...	Andrea Jenkins	Europe	2022-12-03	ComfortLiving Bluetooth Speaker	Electronics	300.68
1	T00112	C0146	P067	2024-05-27 22:23:54	1	300.68	...	Brittany Harvey	Asia	2024-09-04	ComfortLiving Bluetooth Speaker	Electronics	300.68
2	T00166	C0127	P067	2024-04-25 07:38:55	1	300.68	...	Kathryn Stevens	Europe	2024-04-04	ComfortLiving Bluetooth Speaker	Electronics	300.68
3	T00272	C0087	P067	2024-03-26 22:55:37	2	601.36	...	Travis Campbell	South America	2024-04-11	ComfortLiving Bluetooth Speaker	Electronics	300.68
4	T00363	C0070	P067	2024-03-21 15:10:10	3	902.04	...	Timothy Perez	Europe	2022-03-15	ComfortLiving Bluetooth Speaker	Electronics	300.68

[5 rows x 13 columns]

Sample of dataset after merging customer product and transactions

```
[5 rows x 13 columns]
Missing Values:
TransactionID      0
CustomerID         0
ProductID          0
TransactionDate     0
Quantity           0
TotalValue         0
Price_x            0
CustomerName       0
Region             0
SignupDate         0
ProductName         0
Category           0
Price_y            0
dtype: int64
```

Number of missing values =0

```
Missing Values Percentage:
TransactionID      0.0
CustomerID         0.0
ProductID          0.0
TransactionDate     0.0
Quantity           0.0
TotalValue         0.0
Price_x            0.0
CustomerName       0.0
Region             0.0
SignupDate         0.0
ProductName         0.0
Category           0.0
Price_y            0.0
dtype: float64
```

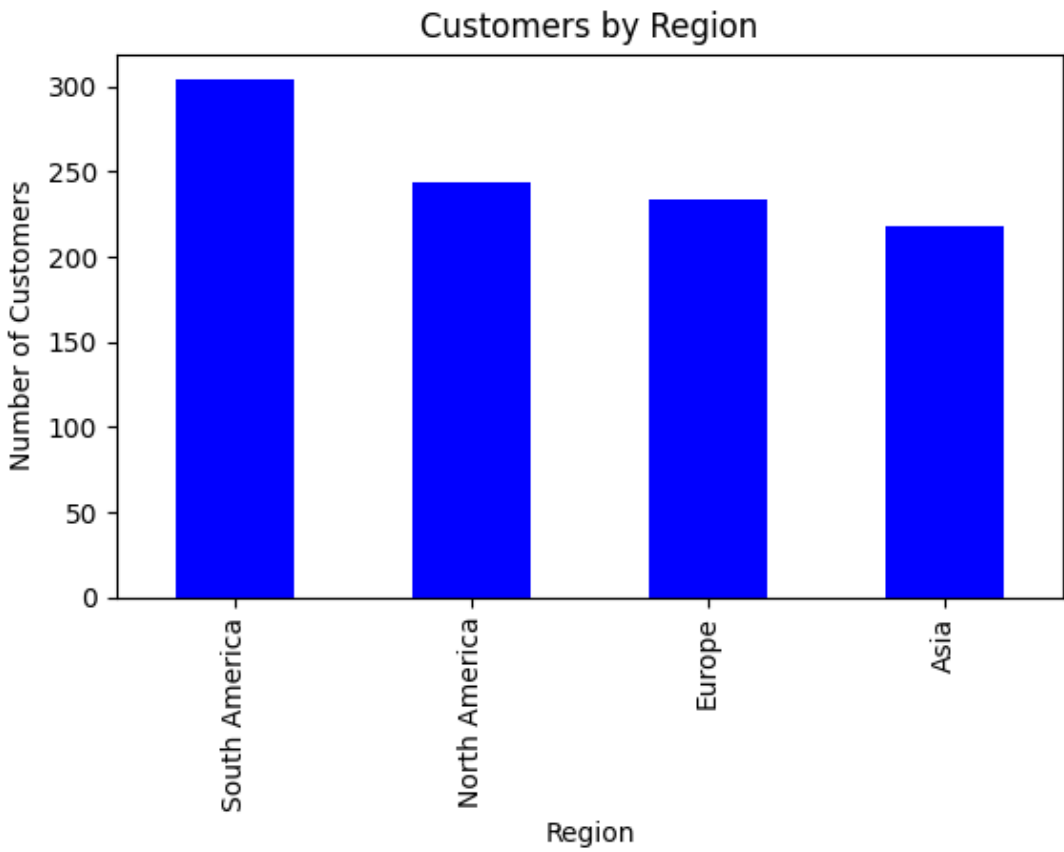
Percentage of missing values = 0.0

Conclusion -We have a preprocessed and clean dataset so we can directly perform **EDA** to get insights.

Customer Level Analysis

Unique Customers: 199		
	Customer Count	Percentage (%)
Region		
South America	304	30.4
North America	244	24.4
Europe	234	23.4
Asia	218	21.8
Unique Products: 100		
Unique Categories: 4		

Unique Customers, Products and Categories



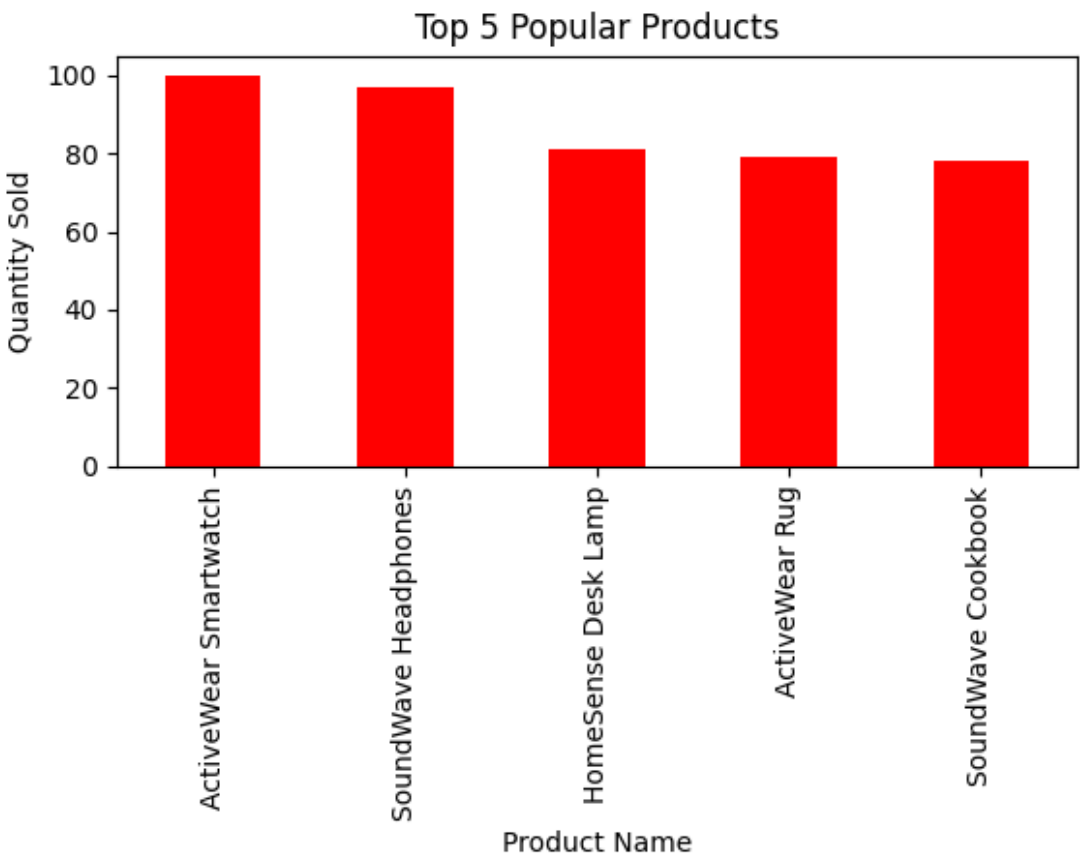
Unique Customers Region wise

Product Level Analysis

Popular Products Summary:

ProductName	Quantity Sold	Percentage (%)
ActiveWear Smartwatch	100	3.941663
SoundWave Headphones	97	3.823413
HomeSense Desk Lamp	81	3.192747
ActiveWear Rug	79	3.113914
SoundWave Cookbook	78	3.074497

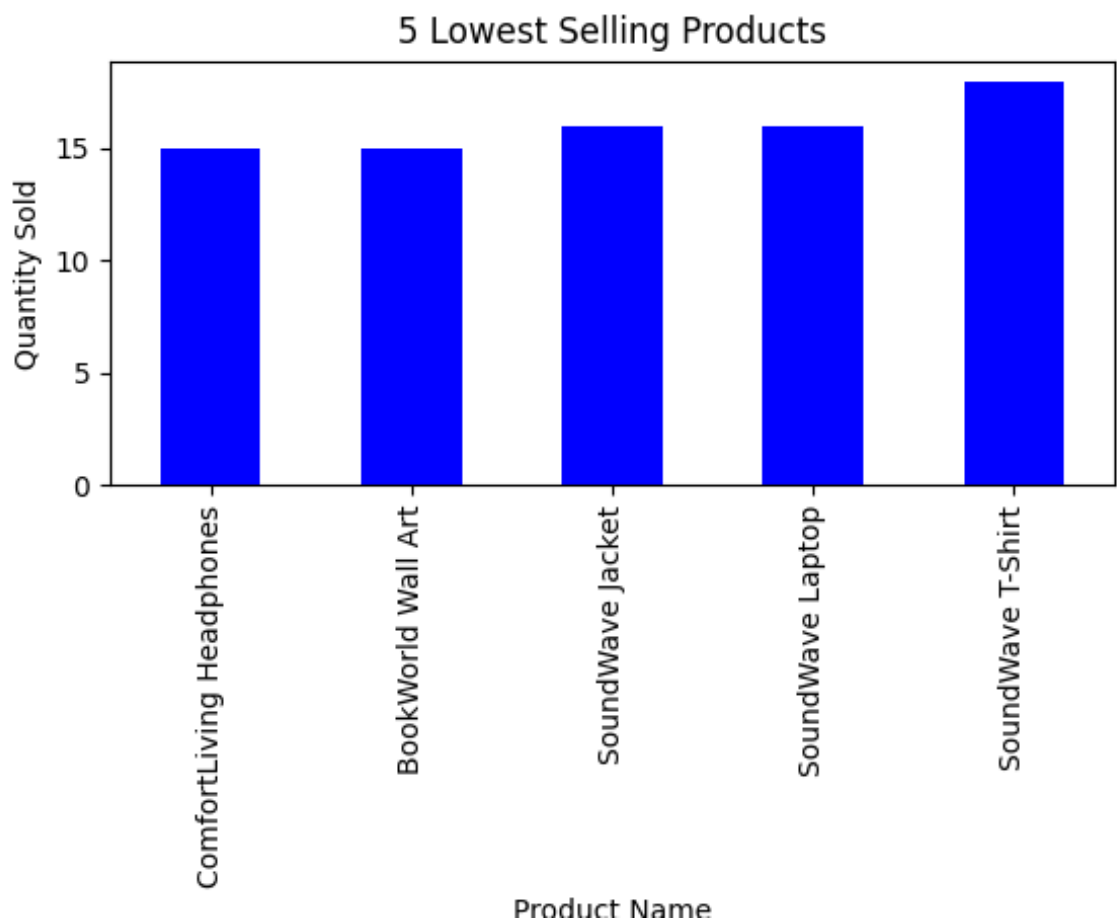
Top 5 Selling Products with quantity sold and percentage out of total sales



Product Level Analysis

Lowest Selling Products Summary:		
	Quantity Sold	Percentage (%)
ProductName		
ComfortLiving Headphones	15	0.591250
BookWorld Wall Art	15	0.591250
SoundWave Jacket	16	0.630666
SoundWave Laptop	16	0.630666
SoundWave T-Shirt	18	0.709499
Total Revenue: \$ 689995.56		

lowest Selling Products with quantity sold and percentage out of total sales

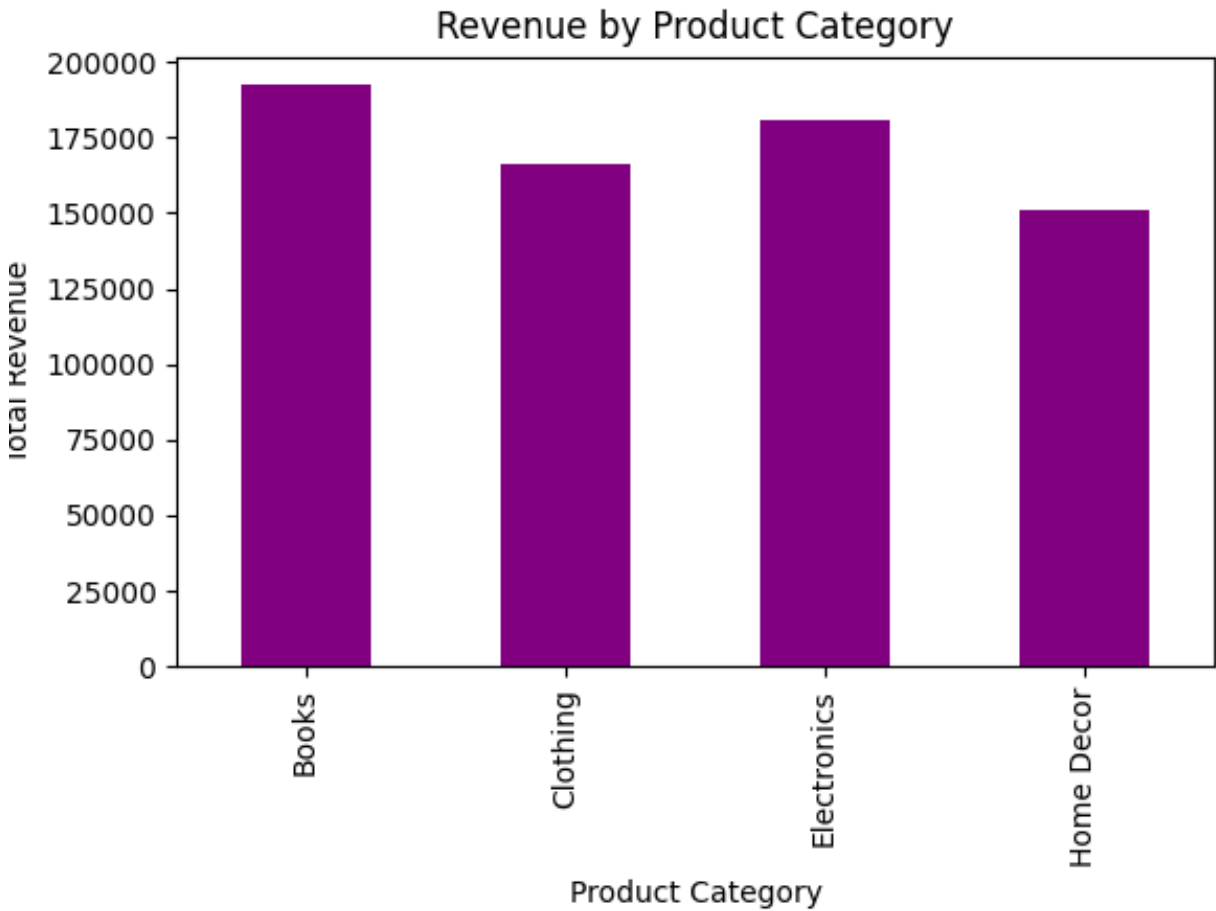


Transaction Level Analysis

Category wise Revenue

Product Category Revenue Summary :		
Category	Total Revenue (USD)	Revenue Percentage (%)
Books	192147.47	27.847639
Clothing	166170.66	24.082859
Electronics	180783.50	26.200676
Home Decor	150893.93	21.868826

Product Category with revenue and percentage out of total sales



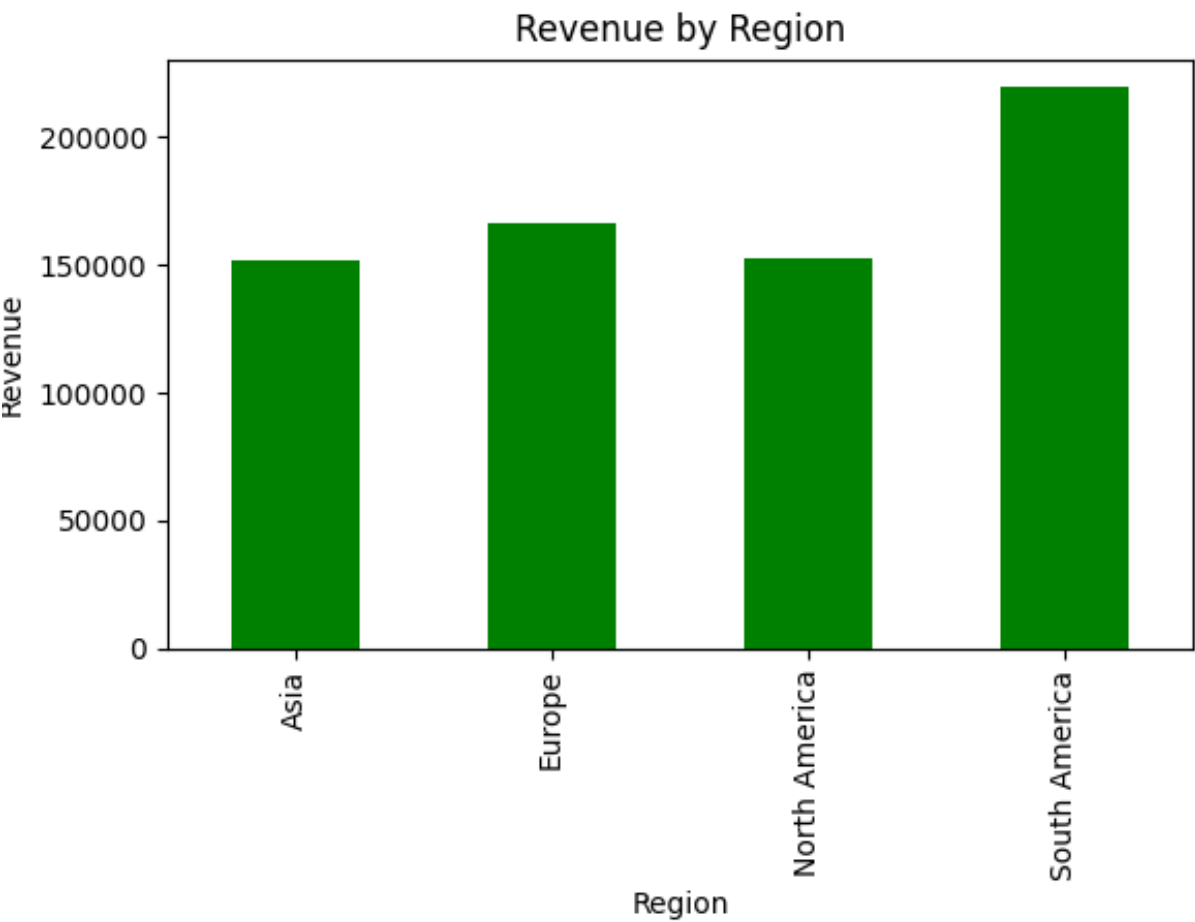
Transaction Level Analysis

Region wise Revenue

Region Revenue Summary :

Region	Total Revenue (USD)	Revenue Percentage (%)
Asia	152074.97	22.039993
Europe	166254.63	24.095029
North America	152313.40	22.074548
South America	219352.56	31.790431

Region with revenue and percentage out of total sales



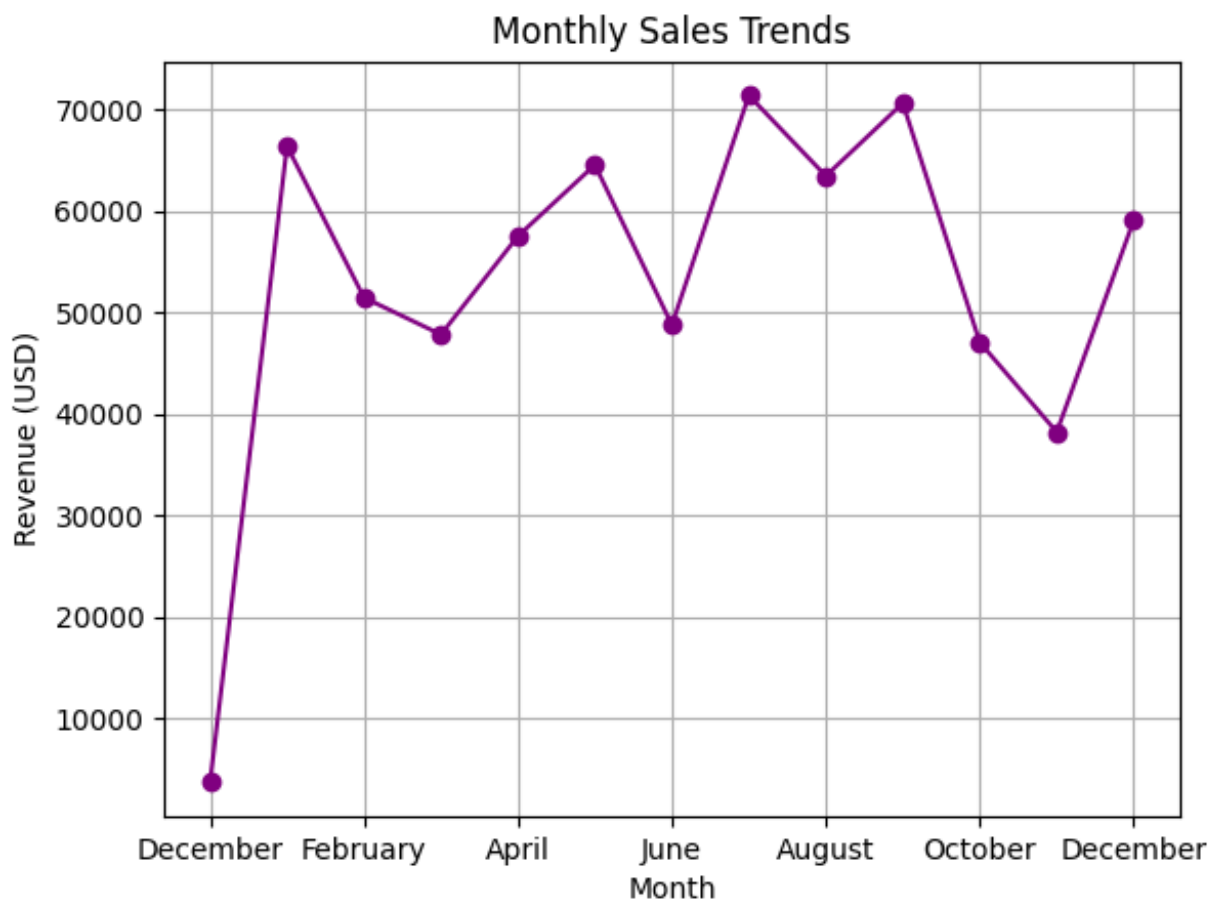
Monthly Sales Summary

Monthly Sales Summary :

TransactionDate	Total Sales (USD)	Sales Percentage (%)
December	3769.52	0.546311
January	66376.39	9.619829
February	51459.27	7.457913
March	47828.73	6.931745
April	57519.06	8.336149
May	64527.74	9.351907
June	48771.18	7.068332
July	71366.39	10.343022
August	63436.74	9.193790
September	70603.75	10.232493
October	47063.22	6.820800
November	38224.37	5.539799
December	59049.20	8.557910

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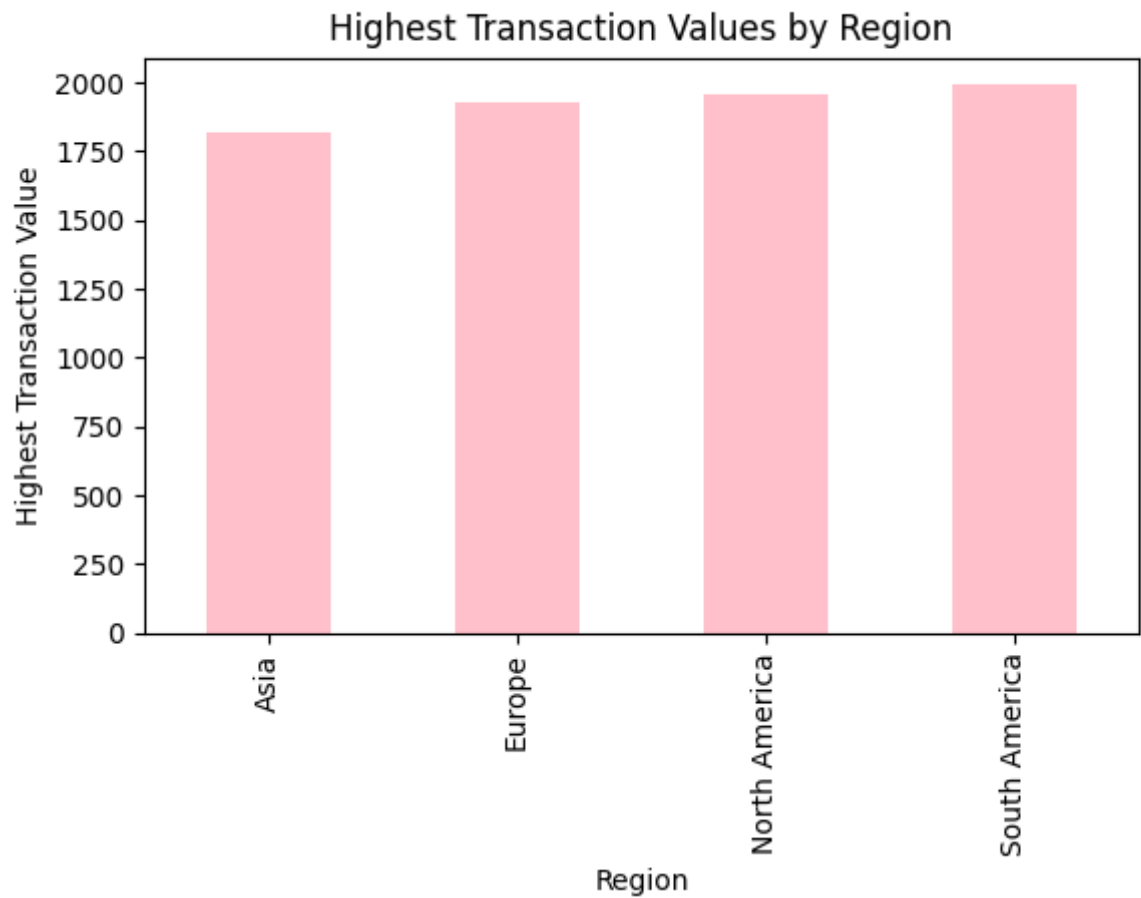
Monthly Revenue and percentage out of total sales



Highest Transaction Summary

Highest Transaction Values by Region:	
Region	Highest Transaction Value (USD)
Asia	1818.12
Europe	1927.12
North America	1954.52
South America	1991.04

Transaction Summary by Region (USD)



Business Insights

After performing the Exploratory Data Analysis (EDA), we can draw the following conclusions and recommend the necessary steps that could help the company enhance its business strategy.

1.South America as the Largest Contributor to Revenue

South America accounts for **31.79% of total sales (\$219,352.56)**, making it the top-performing region. Strengthen this market by enhancing customer service, running targeted promotions, and investing in region-specific campaigns.

2.Active Wear Smartwatch: Top-Selling Product

The **Active Wear Smartwatch** leads sales with **100 units sold (22.98%)**. Focus on **restocking, promoting,** and bundling it with related products to maximize sales and attract repeat buyers.

3.Seasonal Revenue Peaks (July–October)

Revenue surges above **\$70,000** between **July and September (30%)** , likely due to seasonal demand. Prepare by optimizing inventory, improving logistics, and launching pre-season marketing campaigns.

4.The flat graph between **February and June** indicates a lack of growth in sales and revenue. This can be improved by launching new products and expanding product categories."

5. North America Prefers Premium Products

North America shows higher transaction values compared to Asia. Introduce **premium offerings, programs,** and **exclusive collections** for this high-value market base.

6. Books Dominate Revenue

The **Books** category is the top revenue driver. Expand this category with new and innovative products.

7. The lowest-selling product

Comfortliving Headphones with only 15 units sold (**0.59%**), can be removed from the product list. It has a direct competitor, 'Soundwave Headphones,' which is part of the top 5 best-selling products."

Thank you

Mail your feedbacks to:
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