Task 1: Exploratory Data Analysis (EDA) and Business Insights

1. Dataset Overview

The eCommerce Transactions dataset comprises three interconnected files: Customers.csv, Products.csv, and Transactions.csv. The Customers.csv file provides customer information, including their unique IDs, names, regions, and signup dates. The Products.csv file details the product catalog with attributes like product IDs, names, categories, and prices. The Transactions.csv file contains transactional-level details such as transaction IDs, customer IDs, product IDs, transaction dates, quantities, and total values. These files were merged to form a unified dataset for comprehensive analysis.

2. Exploratory Data Analysis Steps

The analysis began with data cleaning, where missing values were identified and appropriately handled. Date columns, such as SignupDate and TransactionDate, were converted into a standard datetime format to facilitate time-series analysis. The datasets were merged on common columns, creating a single dataset for examining relationships between customers, products, and transactions. Key metrics were then calculated, such as revenue by region, product performance, customer spending patterns, and seasonal transaction trends. These were visualized using bar plots and line charts to uncover actionable patterns and insights.

3. Business Insights

Regional Revenue Distribution: The region contributing the highest revenue is South America. This highlights the significance of tailoring marketing and operational strategies to capitalize on high-potential regions.

Top-Performing Products: The top three products driving revenue are ActiveWear Smartwatch, together contributing a significant share of total revenue. Consistent stock availability and targeted promotions for these products are crucial to sustaining their performance.

Seasonal Sales Trends: The data revealed peak sales during January, reflecting strong seasonal demand. Leveraging these months with targeted campaigns and optimized inventory can maximize returns.

Popular Product Categories: The Books category dominates sales, generating. Introducing innovative products within this category can further boost sales and engagement.

Customer Spending Behavior by Region: Customers in South America exhibited the highest average spending per transaction at 721.55 USD. Developing premium products or exclusive offerings tailored to this region could amplify profitability.

Signup Trends: Customer signups peaked between 2023 and 2024. Strengthening digital marketing efforts, such as referral programs and engaging advertisements, is key to reversing this decline.