Graded Mini Project: Part B: Retail Transaction Insights

Problem Statement

A nationwide retail chain is exploring customer behaviour and seasonal trends to improve its strategic decision-making. You have been hired as a data analyst to help the company uncover actionable insights from a sample of past transaction records. The leadership team is particularly interested in patterns related to purchases, customer segments, promotional impact, and seasonal performance.

Data Description

You are provided with a CSV file titled 'Retail_Transactions_Dataset.csv'. Each row corresponds to a unique customer transaction. Below are the columns available in the dataset:

Column Name	Description
Transaction_ID	Unique identifier for each transaction
Date	Timestamp of the transaction
Customer_Name	Name of the customer
Product	List of items bought in the transaction
Total_Items	Number of different items purchased
Total_Cost	Total cost paid by the customer
Payment_Method	Mode of payment used
City	City in which the transaction took place
Store_Type	Type of store (e.g., Supermarket, Warehouse Club)
Discount_Applied	Whether a discount was used
Customer_Category	Segment the customer belongs to
Season	Season in which the transaction happened
Promotion	Type of promotion applied, if any

Project Objective

Perform a comprehensive analysis on this retail dataset to help answer key business questions. Your project should be organised into the following tasks:

Task 1: Data Preparation

- Read the CSV file.
- Parse and convert the Date column into an appropriate format.
- Extract additional useful information like Year, Month, or DayOfWeek from the Date.
- Clean and preprocess the data if required.

Task 2: Basic Exploration

- How many total transactions are there?
- How many unique customers are in the dataset?
- What are the top 5 most common products sold across all transactions?
- Which cities have the highest number of transactions?

Task 3: Customer Behaviour Analysis

- Which customer categories spend the most on average?
- Do certain customer categories prefer specific payment methods?
- What is the average number of items bought per transaction per store type?

Task 4: Promotion & Discount Impact

- What is the average cost of transactions where a discount was applied vs not applied?
- Compare the average number of items purchased for different promotion types.
- Which promotion type seems to be most effective in terms of increasing total cost?

Task 5: Seasonality Trends

- Which season has the highest total revenue?
- Are there seasonal preferences for certain store types or product categories?
- Create a plot showing average spending per season.

Task 6: Visualisation Dashboard

- Bar plot of the number of transactions per city
- Pie chart showing distribution of payment methods
- Line chart of monthly revenue trends (grouped by year if applicable)
- Heatmap or stacked bar showing revenue by season and customer category

Deliverables

Your project should include:

1. Clean, commented Python code
2. Output of all calculations and visualisations

3. A short summary of key insights at the end