**Marketing Campaigns Analysis – Project Writeup**

**Overview**

This project analyzes customer demographics, spending patterns, channel preferences, and promotional campaign responses to identify factors influencing **customer acquisition and retention**. Using **exploratory data analysis (EDA)** and **hypothesis testing**, the aim is to uncover actionable insights that guide marketing strategy.

**Data Scope**

The dataset contains:

* **Demographics**: Birth year, education, marital status, income, children at home.
* **Product Spend**: Amount spent on wine, fruits, meat, fish, sweets, gold, etc.
* **Sales Channels**: Web, catalog, and store purchases.
* **Promotions**: Campaign responses and complaints.

**Technologies Used**

* **Language**: Python 3.x
* **Environment**: Jupyter Notebook
* **Libraries**:
  + **pandas** – Data manipulation and cleaning
  + **numpy** – Numerical operations
  + **matplotlib** & **seaborn** – Data visualization

**Methodology**

1. **Data Cleaning**
   * Standardized categorical variables.
   * Imputed missing income values based on education and marital status.
2. **Feature Engineering**
   * Derived Age, TotalChildren, TotalSpend, and TotalPurchases.
3. **Exploratory Analysis**
   * Visualized spending trends, product performance, and campaign acceptance.
   * Created correlation heatmaps and distribution plots.
4. **Hypothesis Testing**
   * Older customers prefer in-store shopping.
   * Customers with children shop online more often.
   * Channels may cannibalize store sales.
   * US customers have higher total purchases.

**Findings**

* **Product Performance**: Wine and meat generate the highest revenue; some categories underperform.
* **Age & Campaigns**: Younger customers show higher acceptance of recent campaigns.
* **Children Impact**: More children correlate with higher online purchases and lower in-store visits.
* **Geography**: US customers outperform other regions in purchase totals.
* **Complaints**: Certain education groups report more complaints.

**Conclusion**

The analysis reveals patterns in **customer behavior, product demand, and channel usage**. By tailoring campaigns to age groups, family size, and preferred channels, marketing teams can **optimize resources, improve conversion rates, and increase revenue**.